Vol. 939 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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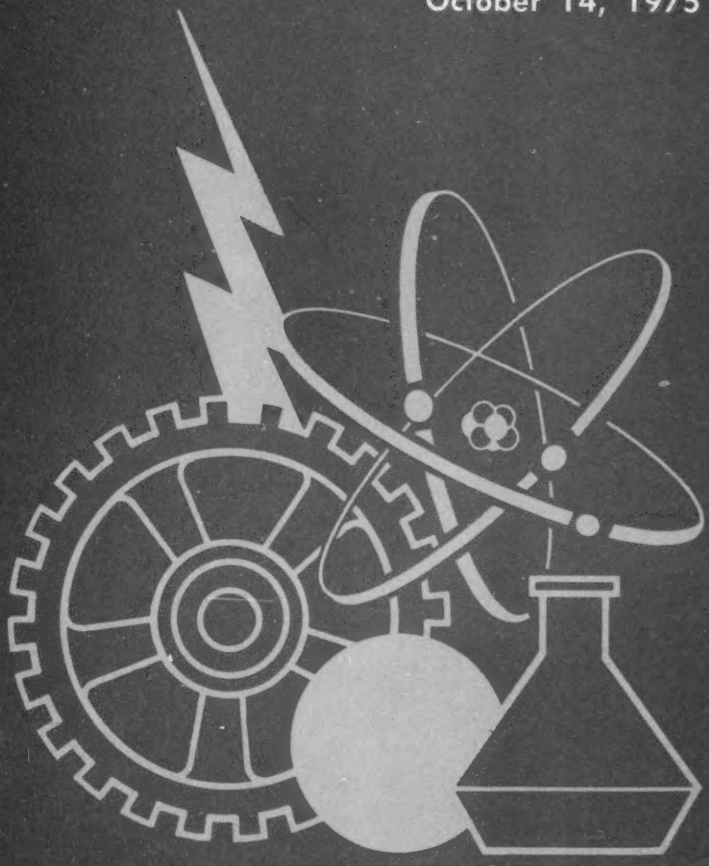
October 14, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

October 14, 1975 Volume 939 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Revision of Form Paragraphs and of First Action Forms for Trademark Applications

The Patent and Trademark Office has concluded its first review and revision of those form paragraphs used in trademark application actions (see 912 O.G. T.M. 310 for further information on the use of these paragraphs). The revision includes new paragraphs on points not previously covered as well as changes to existing paragraphs for clarification and simplification. Additionally, the Trademark Manual of Examining Procedure has been referenced where appropriate.

The revision was implemented in April 1975. A copy of the paragraphs may be obtained by addressing the Commissioner of Patents & Trademarks, Washington, D.C., 20231, Attention: Office of the Director of the Trademark Examining Operation.

The Office has also reviewed and revised the format of the one-page first action letter which contains check-off boxes for refusals, informalities, and notice of publication. Use of the revised letter will begin about September 1975 upon exhaustion of supplies of the previous form.

BERNARD A. MEANY,
Sept. 5, 1975. *Assistant Commissioner for Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,818,235, J. G. Baran, RELEASABLE LATCH SUPPORT FOR PANEL CEILING; **3,698,475,** E. G. Beck, Jr., FLAT SHEET OF METAL HAVING AN ELONGATED MEMBER SECURED THERETO, **filed** June 11, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1523, *Airtex Corporation* v. *Shelley Radiant Ceiling Company.* Enter order denying plaintiff's motion to alter judgment. Judgment is entered for plaintiff, counter-defendant on the third counterclaim and the third counterclaim is dismissed with prejudice, May 15, 1975.

2,830,343, H. F. Shroyer, CAVITYLESS CASTING MOLD AND METHOD OF MAKING SAME; **3,314,116,** Wittmoser, Schade, and Krzyzanowski, GASIFIABLE CASTING PATTERN; **3,498,360,** same, METHOD OF CASTING IN A MOLD WHICH IS COATED DURING CASTING, **filed** June 20, 1975, D.C., S.D. Ohio (Dayton), Doc. C-3-75-153, *The Dayton Casting* v. *Full Mold Process Co.*

2,941,172, W. T. Sutton, Jr., ELECTRICAL WINDING CONSTRUCTION, **filed** June 20, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2022, *Coilcraft, Inc.* v. *TRW, Inc.*

3,099,516, R. M. Henrickson, METHOD OF MOLDING A FOAM PLASTIC HAVING SKINS ON SELECTED SURFACE PORTIONS; **3,523,918,** G. Gonzalez, METHOD OF FABRICATION OF MOLDED PARTS OF POLYURETHANE FOAM HAVING A NON-CELLULAR SURFACE LAYER, **filed** June 10, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-320, *Sheller-Globe Corp. and Societe Quillery* v. *Milsco Manufacturing Company.*

3,314,116. (See 2,830,343.)

3,322,888, C. G. Zemels, COMPRESSION CONNECTOR, **filed** July 2, 1975, D.C., S.D.N.Y., Doc. 75-C-3248, *Burndy Corporation* v. *Kearney-National Inc.*

3,359,460, Ragone and Winston, RF SIGNAL DISTRIBUTION STATION, **filed** July 1, 1970, D.C., S.D.N.Y., Doc. 70-C-2831, *Jerrold Electronics Corporation* v. *Vikos, Inc.* Stipulation, it is hereby stipulated that this action is dismissed with prejudice, June 23, 1975.

3,365,935, H. J. Kane, SOUND DETECTING TEST APPARATUS, **filed** Nov. 13, 1973, D.C., S.D.N.Y., Doc. 73-C-4863, *Hubert J. Kane* v. *Volkswagenwerk Aktiengesellschaft et al.* Filed stipulation and order that the complaint and counterclaims are dismissed with prejudice, June 12, 1975.

3,376,388, M. G. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS; **3,495,181,** same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY, **filed** July 26, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1843, *Martin G. Reiffin* v. *Heath Company et al.* Order case transferred to the Western District of Michigan, June 2, 1975.

3,388,907, Snellman and Keeler, SHEET STACK JOGGING MECHANISM, **filed** July 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2206, *Norfin, Inc.* v. *A. B. Dick Co.*

3,444,865, G. F. De Vita, TRANSFORMATION WIG; **3,812,867,** Wanderman and Wanderman, CAPLESS WIG, **filed** Aug. 27, 1974, D.C., S.D.N.Y., Doc. 74-C-3724-TPG, *Carousel Fashions, Inc.* v. *Gimbel Brothers of New York.* Stipulated that the complaint and counterclaim shall be dismissed without prejudice, June 6, 1975.

3,476,279, R. G. Wharton, CONTAINER CONSTRUCTION, **filed** June 27, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75-2224, *B & F Box & Lumber Company* v. *Ace Export Packing Co., Inc. et al.*

3,495,181. (See 3,376,388.)

3,496,812, White and Meyer, PLASTIC CUTTING DEVICE AND METHOD, **filed** Oct. 27, 1972, D.C., M.D. Fla. (Tampa), Doc. 72-641-C, *Kenneth White* v. *Mar-Bel, Inc. and Mr. Dan Marshlack.* Judgment in favor of plaintiff, June 18, 1975.

3,498,360. (See 2,830,343.)

3,523,918. (See 3,099,516.)

3,555,272, Munson and Field, PROCESS FOR CHEMICAL IONIZATION FOR INTENDED USE IN MASS SPECTROMETRY AND THE LIKE, **filed** June 23, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV-75-2105-JWC, *G. D. Searle & Co.* v. *E. I. du Pont de Nemours & Company, Inc.*

3,565,454, R. L. Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, **filed** July 3, 1975, D.C., S.D. Calif. (Los Angeles), Doc. 75-2297, *Richard Lawrence Stevenson* v. *Grentec, Inc. et al.*

3,576,559, R. W. Gerstenberger, CONTROL APPARATUS FOR LAUNDRY SYSTEM, **filed** July 1, 1975, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL)75-304-C-JE, *Jensen Corporation* v. *R. L. Sjostrom Company, formerly known as Sheetmaster Corp.*

3,585,352, A. J. Zvanut, ARC WELDING PROCESS AND ELECTRODE FOR STAINLESS STEEL; **3,848,100,** same, **filed** June 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV-75-2218-R, *Stoody Co.* v. *Teledyne, Inc., doing business as Teledyne-McKay.*

3,593,629, W. T. Rentschler, PHOTOGRAPHIC CAMERA WITH AUTOMATIC DIAPHRAGM AND TIME SETTINGS, **filed** June 26, 1975, D.C., S.D.N.Y., Doc. 75-C-3130(EW), *Prontor Werk Alfred Gauther GmbH* v. *Eastman Kodak Co.*

3,619,003, M. E. Rich, Jr., REAR-MOUNTED BABY SEAT FOR A BICYCLE, **filed** June 25, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75-540, *The Troxel Manufacturing Company* v. *ACAR Industries, Inc.*

3,625,236, G. Hayano, FOLDABLE UMBRELLA; **3,672,381,** Kida and Saito, COLLAPSIBLE UMBRELLA CAPABLE OF AUTOMATIC OPENING, **filed** July 2, 1975, D.C., S.D.N.Y., Doc. 75-C-3249, *Kazo Saito* v. *Shedrain Umbrella Company.*

3,660,900, L. F. Andrews, METHOD AND APPARATUS FOR IMPROVED ORTHODONTIC BRACKET AND ARCH WIRE TECHNIQUE, **filed** June 25, 1975, D.C., S.D. Calif. (San Diego), Doc. 75-0345-E, *"A"-Company Inc.* v. *Consyne Corporation.*

3,672,381. (See 3,625,236.)

3,678,542, E. Prete, CAM BUCKLE, **filed** June 25, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75-2202-AAH, *Ancra Corporation* v. *Circle Industries, Inc.*

3,698,476. (See 2,818,235.)

3,774,259, J. L. Genaro, AUTOMATIC SURFACE POLISHING SYSTEM, **filed** June 19, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2013, *Shur Brite Wax-O-Matic, Inc.* v. *Garfield Park Auto Laundry, Inc.*

3,776,379, E. M. Harvey, LUMBER SORTER, **filed** Oct. 29, 1974, D.C., M.D. Ala. (Montgomery), Doc. 74-344-N, *Edward M. Harvey* v. *Conveyor-Machinery Corporation et al.* Judgment, patent is valid and owned by plaintiff, defendants are hereby restrained and enjoined from infringing any claim of said patent. Final judgment is hereby entered against defendant, June 25, 1975.

3,812,867. (See 3,444,865.)

3,844,523, M. J. Wilhelm, MOLD HAVING A BREATHABLE RELEASE SHEET ACROSS THE TOP, **filed** June 23, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–351, *Unisource Corporation* v. *Adrosil Corporation.*

3,848,109. (See 3,585,352.)

3,851,630, R. E. Standridge, APPARATUS FOR INJECTING COLORANT INTO INJECTION MOLDING, **filed** June 24, 1975, D.C., N.D. Ga. (Atlanta), Doc. C75–1216A, *Evans Products Company* v. *Standridge Corporation and Robert E. Standridge.*

3,858,623, L. R. Lefkowitz, PAPERMAKERS FABRICS, **filed** July 1, 1975, D.C., M.D. Ala. (Montgomery), Doc. 75–225–N, *Huyck Corporation* v. *Albany International Corporation.*

3,859,565, Lee A. Henningsen, FIRE PUMP CONTROL APPARATUS, **filed** June 20, 1975, D.C.N.J. (Newark), Doc. 75–1087, *Firetrol, Inc.* v. *Lexington Control, Inc.*

3,860,164, H. S. Dworkin, END CONSTRUCTION FOR BELLOWS TYPE ENVELOPES AND THE LIKE, **filed** July 7, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75–1942, *Howard D. Dworkin* v. *American Fiber-Velope Manufacturing Co., Inc.*

3,890,157, H. N. Babcock, CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, **filed** June 18, 1975, D.C., N.D. Ohio (Toledo), Doc. C75–250, *Construction Products Research, Inc.* v. *Sterling Drug, Inc. and Lehn & Fink Industrial Products Company.*

Certificates of Correction for the Week of Oct. 14, 1975

Re. 28,155	3,868,244	3,885,101	3,892,753
Re. 28,349	3,868,609	3,885,470	3,892,836
Re. 28,398	3,869,304	3,885,940	3,892,903
3,664,415	3,869,346	3,886,313	3,892,906
3,688,652	3,869,429	3,886,408	3,892,918
3,715,760	3,870,426	3,886,522	3,893,131
3,772,982	3,870,505	3,886,638	3,893,141
3,785,100	3,870,953	3,887,036	3,893,636
3,785,993	3,871,648	3,887,375	3,893,887
3,792,403	3,871,887	3,887,611	3,894,023
3,796,749	3,872,107	3,887,639	3,894,200
3,808,774	3,872,257	3,887,863	3,894,236
3,809,753	3,872,894	3,887,895	3,894,271
3,821,735	3,873,382	3,888,045	3,894,295
3,825,649	3,873,464	3,888,162	3,894,515
3,826,683	3,874,238	3,888,269	3,894,610
3,835,056	3,874,324	3,888,838	3,894,949
3,835,576	3,875,024	3,888,840	3,894,972
3,836,370	3,875,162	3,888,948	3,895,153
3,837,353	3,875,388	3,888,966	3,895,398
3,841,847	3,876,647	3,889,009	3,895,617
3,842,632	3,876,685	3,889,104	3,895,624
3,843,456	3,876,944	3,889,141	3,895,803
3,843,585	3,877,066	3,889,517	3,895,876
3,843,896	3,877,262	3,889,724	3,895,973
3,846,147	3,877,481	3,889,729	3,896,251
3,847,016	3,877,712	3,889,845	3,896,294
3,847,962	3,879,104	3,889,983	3,896,345
3,851,648	3,879,279	3,889,990	3,896,385
3,852,674	3,879,436	3,890,178	3,896,601
3,853,537	3,880,147	3,890,215	3,896,634
3,854,054	3,880,284	3,890,259	3,896,681
3,855,153	3,880,891	3,890,260	3,896,885
3,855,207	3,881,015	3,890,316	3,896,977
3,856,427	3,881,323	3,890,434	3,897,260
3,856,816	3,881,557	3,890,467	3,897,303
3,858,636	3,881,779	3,890,669	3,897,489
3,858,649	3,882,078	3,890,816	3,897,548
3,859,080	3,882,220	3,891,158	3,897,620
3,860,405	3,882,520	3,891,362	3,897,880
3,860,609	3,882,816	3,891,498	3,897,981
3,860,619	3,883,084	3,891,504	3,898,014
3,860,859	3,883,386	3,891,510	3,898,389
3,862,165	3,883,527	3,891,698	3,898,783
3,862,381	3,884,627	3,891,965	3,899,162
3,863,116	3,884,699	3,892,118	3,899,444
3,863,256	3,884,778	3,892,153	3,900,410
3,863,710	3,884,879	3,892,212	3,901,294
3,865,343	3,884,925	3,892,357	3,901,447
3,866,151	3,884,957	3,892,495	3,901,758
3,866,889	3,884,982	3,892,563	3,902,045

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 13, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-28-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-1-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding, Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-20-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-19-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-4-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-11-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-6-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-8-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-14-75

Expiration of patents: The patents within the range of numbers indicated below expire during October 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,854,669 to 2,858,536 inclusive
Plant Patents..... Numbers 1,758 to 1,767 inclusive

REISSUES

OCTOBER 14, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,568

ELECTROPHOTOGRAPHIC COPYING MACHINE

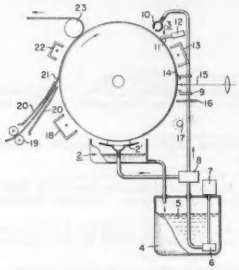
Takashi Saito, Tokyo, and Yujiro Ando, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,711,796, dated Jan. 16, 1973, Ser. No. 166,820, July 28, 1971. Application for reissue Apr. 19, 1974, Ser. No. 462,327

Claims priority, application Japan, July 29, 1970, 45-66295; Mar. 30, 1970, 45-26736

Int. Cl.[2] G03G *15/10, 15/22*

U.S. Cl. 355—15 **29 Claims**



7. An electrophotographic copying machine including a medium capable of bearing thereon an electrostatic latent image of the original to be copied, means for establishing said electrostatic latent image on said medium, liquid developing means for developing said electrostatic latent image, transfer means for transferring the thus developed image to copy material and cleaning means, said cleaning means comprising a cleaning member disposed in contact with said medium for cleaning same for repeated use, a cleaning liquid tank, and means for applying cleaning liquid from said liquid tank to the areas of both said medium and said cleaning member near the contact area therebetween before cleaning action of said cleaning member is started.

Re. 28,569

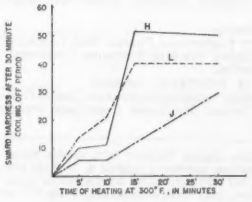
IN SITU PROCESS FOR TRANSISOMERIZATION AND CONJUGATION OF RESINS CONTAINING FATTY ACID ESTERS

Lowell O. Cummings, San Anselmo, Calif., assignor to PVO International Inc., San Francisco, Calif.

Original No. 3,668,159, dated June 6, 1972, Ser. No. 101,057, Dec. 23, 1970. Application for reissue June 25, 1973, Ser. No. 372,949

Int. Cl. C08g *17/16*

U.S. Cl. 260—18 EP **18 Claims**



1. A process for making a coating resin which comprises:

a. admixing a polyunsaturated, unconjugated fatty acid-providing substance *chosen from the group consisting of linoleic acid, safflower oil, sunflower oil, walnut oil, soy oil, linoleic acid-enriched tall oil fatty acids and segregated cottonseed oil fatty acids* and

b. an esterification component which is an epoxy resin liquid at the temperature of reaction or an alkyd resin forming mixture of a polyhydric alcohol and a polybasic carboxylic acid-providing material,

c. heating said admixture to a temperature of from 425° F. to 550° F. to cause said substance and said resin or alkyd-forming mixture to react,

d. bubbling sulfur dioxide gas through said admixture [all] during *at least a final portion of* step [s] and *all during* step e, [and]

e. reacting said substance and said resin or alkyd-forming mixture to form a conjugated resin having an increased proportion of trans trans conjugation as compared with a conjugated product not reacted in the presence of sulfur dioxide, and also having many isolated trans bonds, and

f. then, when a desired acid value and conjugation have been attained, discontinuing flow of sulfur dioxide, purging sulfur dioxide from said conjugated resin by blowing with inert gas, and recovering said conjugated resin.

Re. 28,570

HIGH TEMPERATURE TREATMENT OF MATERIALS

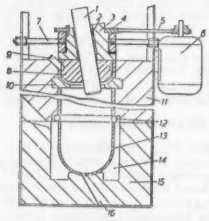
Jozef Kazimierz Tylko, Faringdon, England, assignor to Tetronics Research and Development Co. Ltd., Faringdon, England

Original No. 3,783,167, dated Jan. 1, 1974, Ser. No. 225,892, Feb. 14, 1972. Application for reissue May 13, 1974, Ser. No. 469,615

Claims priority, application United Kingdom, Feb. 16, 1971, 4789/71; Feb. 16, 1971, 4790/71; Aug. 18, 1971, 38855/71

Int. Cl. H05b *7/00*

U.S. Cl. 13—1 **34 Claims**



1. A plasma furnace for treatment of materials comprising at least one upper electrode capable of movement along its own longitudinal axis and coacting with a lower annular stationary electrode, means moving said upper electrode in a substantially closed arcuate path with respect to said stationary electrode, means establishing an electrically conductive path between said upper and said lower electrodes, means developing a radially expanded plasma column between said electrodes, means introducing feedstocks into said plasma column, means conducting further substances into the plasma effluents issuing from said annular electrode, means collecting, quenching, separating and discharging the products issuing from the vicinity of said annular electrode, a cooling system associated with said electrodes, and a furnace body containing the electrode assemblies product collecting vessels and conducting means.

Re. 28,571

ATTENUATED LIGHT COUPLING BETWEEN SCINTILLATION AND PHOTOMULTIPLIER

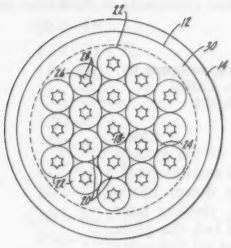
Kai Lange, Copenhagen, Denmark, assignor to General Electric Company, Waukesha, Wis.

Original No. 3,774,032, dated Nov. 20, 1973, Ser. No. 191,891, Oct. 22, 1971. Application for reissue Feb. 25, 1974, Ser. No. 445,679

Claims priority, application Denmark, Nov. 19, 1970, 5885/70

Int. Cl. G01t *1/20*

U.S. Cl. 250—366 **8 Claims**



1. In a radiation image device having a scintillator, means for emitting electrons in response to light from said scintillator, and light conductive means between the scintillator and electron emitting means, the improvement comprising means on either the light conductive means or the electron emitting means and between the scintillator and the electron emitting means for selectively attenuating the light emitted by said scintillator.

Re. 28,572

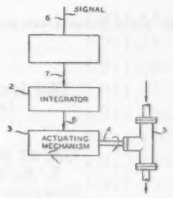
SIGNAL GENERATION

William J. Thornhill, Lexington, Ky., and Richard O. Welty, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 3,649,842, dated Mar. 14, 1972, Ser. No. 820,585, Apr. 30, 1969. Division of Ser. No. 502,096, Oct. 22, 1965, Pat. No. 3,467,905. Application for reissue May 10, 1974, Ser. No. 468,880

Int. Cl. H03k *3/00*

U.S. Cl. 307—106 **9 Claims**



1. A method for producing a resultant signal composed of a series of pulses each having substantially equal time duration and each pulse being spaced from the other by a variable time interval, which resultant signal is in proportion as to its variable time interval to a first signal of a varying magnitude, comprising producing in response to said first signal an intermediate signal composed of a series of pulses each having a variable time duration in proportion to the magnitude of said first signal and each formed during one of a series of sequential time intervals, each time interval being of substantially equal length, and then producing in response to said intermediate signal said resulting signal.

PLANT PATENTS

GRANTED OCTOBER 14, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,794

ROSE PLANT

Olaf Soenderhousen, Hoersholm, Denmark, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jan. 16, 1974, Ser. No. 433,924

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—16 **1 Claim**

1. An asexually reproduced rose plant of the grandiflora class substantially as herein illustrated and described, being especially characterized in that the flower has a strong orange color when freshly opened, yielding later to an orange pink, tinged with yellow and red, the plant further having in combination, a plurality of the following features, namely, the bush is of an upright moderately branched and spreading habit, has glossy foliage with relatively small leaves, and produces buds which are nearly globular, generally in clusters of three to five on each stem; which buds open to produce flowers of about 3 inches in diameter with double petalage of 55 to 70 petals, of obovate and mucronate shapes, plus 8 to 16 petaloids, the bloom having a fragrance of musk to tea, said plant blooming almost continuously during the growing season.

PATENTS

GRANTED OCTOBER 14, 1975

ERRATA

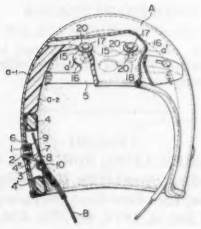
For CLASS	See PATENT NO.
228–173	3,911,553
084–392	3,911,784
124–011 R	3,911,888
161–001	3,911,971
152–208	3,911,984
320–039	3,912,108
280–478	3,912,119
229–041 B	3,912,331
303–021 P	3,912,337
303–021 BE	3,912,340
356–170	3,912,372
416–244	3,912,375
156–104	3,912,542
360–079	3,912,694

PATENTS

GRANTED OCTOBER 14, 1975

GENERAL AND MECHANICAL

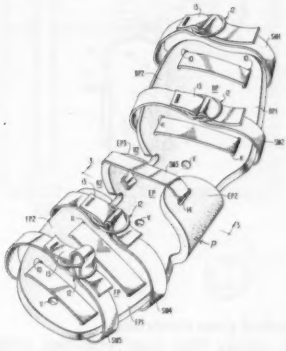
3,911,496
HELMET STRUCTURE
Hirotake Arai, and Michio Ari, both of No. 12 Higashi 2-chome, Oomiya, Saitama, Japan
Filed May 9, 1974, Ser. No. 468,271
Claims priority, application Japan, May 14, 1973, 48-56382; May 14, 1973, 48-56383
Int. Cl.² A42B *1/08*
U.S. Cl. 2—3 R **5 Claims**



1. A helmet structure containing a pair of ear-caps and a chin-strap, said ear-caps and said chin-strap being removably attached to the inside surface of said helmet structure, a wearing band removably attached to the inside surface of said helmet structure, said helmet structure being provided with a stud-like element at both positions where the ear-caps are located, said stud-like element projecting inwardly from the inside surfaces thereof, an apertured element attached to both ends of the chin-strap, said apertured element being movably attached to said stud-like element so that the apertured element can be detached and the chin-strap removed only when the chin-strap is rotated upwardly, said helmet structure also having a shock-absorbing liner which is cut out on both sides of the helmet to receive said ear-caps, said stud-like element extending through and supporting said ear-caps.

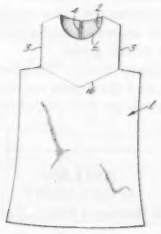
3,911,497
ARM PROTECTING DEVICE
Fielding H. Lewis, Jr., Towson, and William C. Crawford, Pasadena, both of Md., assignors to Wm. T. Burnett & Co., Incorporated, Baltimore, Md.
Filed Nov. 13, 1974, Ser. No. 523,479
Int. Cl.² A41D *13/08*
U.S. Cl. 2—16 **23 Claims**

1. An arm protecting device comprising a flexible cushioning pad including a biceps portion, a forearm portion and an intervening elbow portion connecting the biceps and forearm portions, there being relief spaces in the periphery between said elbow portion and the biceps and forearm portions, respectively, for enabling the three said portions to be shaped in place on a wearer's arm to conform substantially to the wearer's biceps, forearm and elbow, respectively, and securing



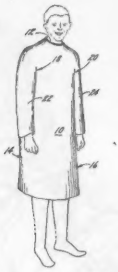
means for shaping said portions to the wearer's arm as aforesaid and securing said pad in place on the wearer's arm.

3,911,498
ACTIVE SPORTS GARMENTS
Eleanor Van Staagen, Rowayton, Conn., assignor to Gordon Clothes, Inc., Conshohocken, Pa.
Filed July 5, 1974, Ser. No. 485,920
Int. Cl.² A41D *1/22*
U.S. Cl. 2—74 **6 Claims**



1. A sleeveless garment having therein a neck opening and a pair of arm openings disposed at opposite sides of said neck opening, and a lining of perspiration absorbent material secured interiorly of the garment in the neck and arm opening areas thereof comprising lining portions disposed inwardly adjacent the neck and arm openings in the garment and extending about the peripheral edges of said openings, said lining comprising an absorbent base fabric having absorbent pile elements projecting from at least the outer surface thereof and disposed to engage the skin of the wearer of the garment, said absorbent pile elements functioning as wicks to transfer perspiration moisture from the skin of the wearer to the lining portions and operable to space the garment from the wearer's skin and provide aeration and ventilation therebetween thereby evaporating moisture absorbed by the lining and cooling the wearer'skin.

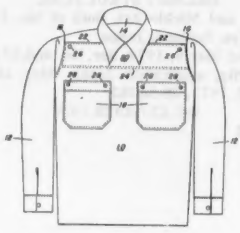
3,911,499
DISPOSABLE MEDICAL GOWN
Joseph Benevento, and Kurt W. Hinsch, both of Tucson, Ariz., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed June 6, 1974, Ser. No. 477,150
Int. Cl.² A41B 9/00
U.S. Cl. 2—114 2 Claims



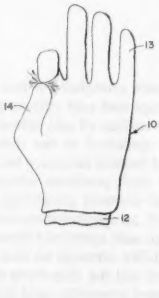
1. A medical gown comprising:
a single unitary front panel extending continuously and without seams from the neck portion downward to about the knees of the wearer across the front of the body and outwardly along both arms,
the front panel extending continuously and without seams to provide sections at both sides, below the armpit areas extending around the sides and across the back of the wearer to the middle of the back and sections along both arms extending around the arms and meeting underneath the arms, said sections along both arms further having top panels extending across the top of the back of the wearer to about the middle of the back,
said sections meeting underneath both arms being connected by seams extending from each wrist underneath each arm to the armpit areas, and said sections at both sides extending across the back being joined to said panels by horizontal seams extending from the armpit area across the back of the gown,
such that the complete front of the gown when worn has no exposed seams, and the seams required for a form fitting garment are entirely on the back of the wearer and underneath the arms.

3,911,500
SPORT SHIRT
Vera Naumovski, 60 Roseland Drive, Toronto, Ontario, Canada (M8W 1Y9)
Division of Ser. No. 337,499, March 3, 1973, Pat. No. 3,825,954. This application Apr. 29, 1974, Ser. No. 465,239
Int. Cl.² A41B 1/00
U.S. Cl. 2—115 1 Claim

1. A sport shirt comprising a conventional sport shirt body having a front panel and a back panel secured at their edges in a fashion to define a body opening at a base end and a neck opening at an upper end, said front panel having a slit extending downwardly from said neck opening,
a triangular flap extending across said front panel and having a first portion thereof secured to said panel and having a free upper portion,
a middle fastener for said triangular flap defining the base of a fold when said triangular flap is folded into the downward position,
means securing said portion to said front panel between said neck opening and the upper ends of said first and second pockets,
second means securing said free upper portion downwardly from said middle fastener and medially located on said front panel,
third interengaging fastening means on said free end of said flap such that said free end can be selectively interengaged with either of said first fastening means or said second fastening means.



3,911,501
SELF-LUBRICATING SURGICAL GLOVE
Murray Harold Seltzer, Short Hills, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Jan. 4, 1974, Ser. No. 430,634
Int. Cl.² A41D 19/00
U.S. Cl. 2—167 5 Claims

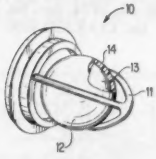


1. A surgical glove for use by physicians in conducting internal examinations of patients, comprising a glove constructed of thin flexible sheet material for receiving and adapted to fit snugly over the hand and all fingers of the user and including a plurality of finger stalls and a thumb stall, one of said stalls having a liquid compartment integral therewith, said compartment being adapted to receive and releasably retain a lubricant therein.

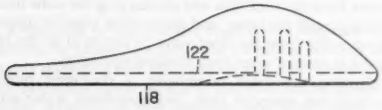
3,911,502
COMPOSITE HEART VALVE POPPET
John W. Boretos, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.
Filed Aug. 23, 1974, Ser. No. 500,056
Int. Cl.² A61F 1/22
U.S. Cl. 3—1.5 1 Claim

1. A composite heart valve poppet for use in ball-in-cage type artificial heart valves, comprising: a ball-shaped core of a rigid material, said core having applied thereto a layer of physiologically inert elastomeric material, said layer having a

thickness of from 0.5 to 3.0 mm, said core material being polypropylene having a specific gravity of 0.9, and said elastomeric material being segmented polyether polyurethane having a specific gravity of 1.1.



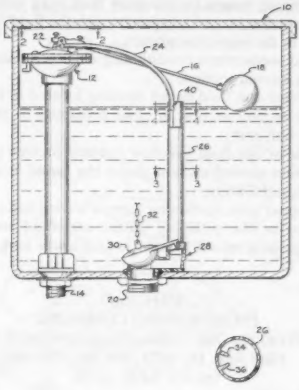
3,911,503
BREAST PROSTHESIS
George Hankin, Box 32 Foster Road, Southwick, Mass. 01077
Filed Jan. 21, 1974, Ser. No. 435,229
Int. Cl. A61f *1/24;* **A41c** *3/10*
U.S. Cl. 3—36 **1 Claim**



1. A surgical breast prosthesis adapted to be worn inside a brassiere by a woman who has had a breast removed surgically comprising: a distended hermetically-sealed casing of substantially impervious material containing an elastic filling of gel, the casing including a substantially conical substitute breast body portion adapted to fit into and to be worn inside the breast cup of the brassiere and including a laterally projecting tongue formed as an integral extension of the substitute breast body portion, the tongue being of substantially uniform thickness throughout its extent and having a front face curved slightly rearwardly from its inner end to its outer end relative to the body portion and terminating in a substantially straight rearward marginal edge, interrupting means in the form of a plurality of projections of varying lengths disposed within the substitute breast body portion and a stiffening member within the substitute breast body portion and tongue, the tongue being adapted for tucking into the substitute breast body portion for varying the size and shape of the latter or for fitting the area of the body of the wearer which is below the underarm and from which tissue has been removed as an incident to the removal of the breast.

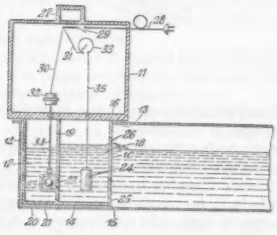
3,911,504
TOILET FLUSH TANK APPARATUS
George Koket, Erie, Pa., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed May 31, 1974, Ser. No. 475,299
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 **2 Claims**

1. In a toilet flush tank in which are mounted (1) a ball cock that is in communication with a source of water and (2) an outlet valve and an associated upright overflow tube that are in communication with the toilet flush tank outlet for discharge of water to a toilet bowl, said ball cock having an outlet fitting for supplying refill water to the toilet bowl subsequent to a flush of the toilet, the improvement comprising said overflow tube being an extrudate of thermoplastic material having a uniform cross-section throughout its length and including two integral flanges radially inwardly directed from the inner wall of the tube the full length thereof, said flanges being adjacent to one another to provide a relatively restricted longitudinal passageway the length of the tube, and a flexible refill tube connected at one end to said outlet fitting and



having its other end retained within the confines of the upper portions of said radially inwardly directed flanges and the inner wall of said overflow tube.

3,911,505
HYDROTHERAPY APPARATUS
Walter E. Zaborowsky, 30-15 232nd St., Queens Village, N.Y. 11427
Continuation-in-part of Ser. No. 719,419, April 8, 1968, abandoned. This application Apr. 13, 1972, Ser. No. 243,858
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 **1 Claim**



1. Hydrotherapy apparatus adapted to be partly immersed in an open-topped body adapted to be partially filled with a supply of liquid, said body including generally upright walls and a generally horizontal bottom, said apparatus comprising:
a. lower and upper tanks forming an integral unit having generally upright side walls and a generally horizontal bottom;
b. means for positioning said unit within said body adjacent one of said body walls, with the bottom of said unit closely spaced from the bottom of said body;
c. a water-impervious separator plate between said upper and lower tanks positioned above the liquid level in said body;
d. said lower tank comprising:
1. a first section immediately adjacent the wall of said body upon which the unit is positioned;
2. a second section substantially removed from said wall;
3. a generally upright separator plate separating said first section from said second section and having a fluid inlet opening therein;

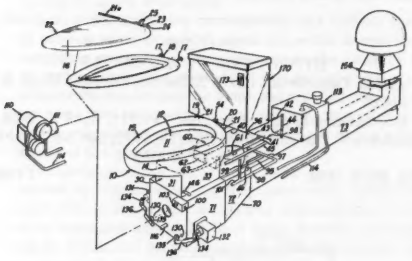
4. fluid inlet means on the bottom of said first section adapted to permit fluid from said body to enter said first section;
5. pumping means for pumping fluid from said first section to the second section through the fluid inlet opening in the separator plate;
6. fluid temperature conditioning means contained within said second section;
7. at least one fluid outlet opening located in the wall of said second section in close proximity to the bottom thereof; and
8. at least one fluid overflow opening located in the wall of said second section above the liquid level of fluid within the body;

e. said upper tank containing therein driving and controlling means for the pumping means and fluid temperature conditioning means located in said lower tank.

3,911,506
INCINERATING COMMODE

James I. West, Jr., 7856 Feilder Road, Jonesboro, Ga. 30236

Filed Apr. 16, 1971, Ser. No. 134,650
Int. Cl. A47k 11/02
U.S. Cl. 4—131 10 Claims



1. An incinerating commode for use in disposing of human waste comprising, in combination:

a. a commode body defining means permitting human waste to be introduced therein;

b. a combustion chamber operatively associated with said commode body for receiving said waste introduced into said commode body, said combustion chamber including means defining a confined passageway surrounding said combustion chamber;

c. cyclically operable heat source means operatively associated with said combustion chamber for incinerating waste contained therein;

d. selectively operable control means for initiating a cycle of operation of said heat source means;

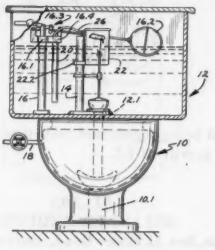
e. first air circulation means operatively associated with said combustion chamber for creating a flow of cooling air through said passageway surrounding said combustion chamber; and,

f. second air circulation means operatively associated with said combustion chamber for directing the heat source means into said combustion chamber, and wherein said first air circulation means and said second air circulation means are cyclically controlled for combined operation to direct a combined flow of air through said combustion chamber after a predetermined time cycle of operation of said heat source means whereby said combined flow of air will purge said combustion chamber of gas and ash by-products of combustion.

3,911,507
TOILET CLEANING APPARATUS

Lennart L. Johnson, 2749 NE. Johnson St., Minneapolis, Minn. 55418

Filed July 22, 1974, Ser. No. 490,231
Int. Cl.² E03D 9/02
U.S. Cl. 4—224 11 Claims



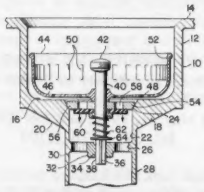
1. In a toilet assembly having a bowl and a reservoir tank containing a riser tube with float valve, a hush tube for receiving water from the riser tube and discharging the same into the reservoir to refill the latter, and an overflow pipe for supplying make-up water from the float valve to the bowl as the reservoir tank is refilled after each flushing operation,

a cleaning apparatus comprising a container mounted within the reservoir tank and containing water-soluble detergent and coloring agent, a by-pass tube connecting the riser tube through the float valve with the container to supply make-up water to the container, a manually adjustable regulator valve for regulating the volume of by-pass water supplied to the container during each flushing operation, and a conduit connecting the container adjacent its upper end to the overflow pipe for directing an equal volume of make-up water containing detergent and coloring agent from the container to the bowl, the amount of detergent in the make-up water being sufficient, when added to water remaining in the bowl immediately after a flushing operation, to provide the resulting bowl water with at least a predetermined minimum detergent concentration.

3,911,508
KITCHEN SINK DRAIN CAP

Myron A. Goldberg, Tuckahoe, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 7, 1974, Ser. No. 467,634
Int. Cl. A47k 1/14
U.S. Cl. 4—287 6 Claims



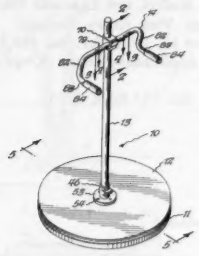
1. A drain device for sinks, tubs and tanks comprising main drain device body means engageable with said sinks, tubs and tanks for draining fluid therefrom, valve means carried by said main drain device body means for opening said drain device body means for outflow discharge of fluid from said sink, tub and tank, and for closing said drain device body means to block said fluid discharge, and valve control means for regulating the degree of and extent of positioning of said valve means for controlling said fluid discharge.

3,911,509

PATIENT TRANSFER STAND

Elwin H. Fleckenstein, 1402 Exchange St., Alden, N.Y. 14004

Filed Apr. 22, 1974, Ser. No. 462,859
Int. Cl.² A61G 1/02, 7/02
U.S. Cl. 5—92 13 Claims



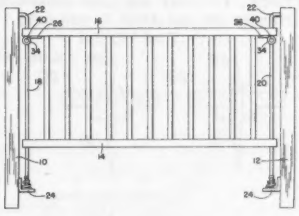
1. A rotatable patient transfer stand comprising base means, a platform for receiving a patient in a standing position, means rotatably mounting said platform on said base means, handle means extending upwardly above said platform for grasping by a patient standing on said platform, and brake means effectively interposed between said platform and said base means and operable during rotation of said platform on said base means to resist rotation therebetween.

3,911,510

TWO MOTION SAFETY LOCK FOR CRIB DROP SIDES

Robert G. Bryant, Gardner, Mass., assignor to GEM Industries, Inc., Gardner, Mass.

Filed June 13, 1974, Ser. No. 479,029
Int. Cl.² A44B 17/60; A47D 9/00
U.S. Cl. 5—100 12 Claims



1. A crib having a drop side including a rail, and drop side guide rods therefor, a notch in a guide rod and a biassed pin on the drop side, the pin being biassed to enter the notch and lock the drop side in predetermined position against motion thereof on the guide rods, a barrel on the drop side, said pin being slidably located in said barrel, a head on the pin,

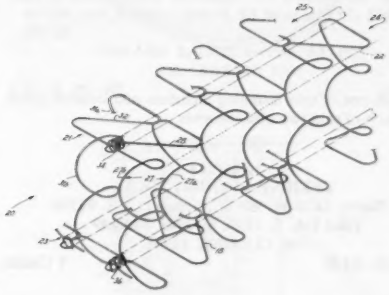
a safety member slidably mounted on the barrel, a spring constantly urging said safety member toward said head, and means on said safety member receiving certain portions of said head at least in part covering the same and preventing retraction of the head and therefore the pin from locking position with respect to said notch, whereby it is necessary to push the safety means in the direction toward the drop side to make accessible the head on the pin so that it can be engaged by the fingers and retracted.

3,911,511

SPRING ASSEMBLY

Larry Higgins, and Henry Zapletal, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Nov. 29, 1974, Ser. No. 528,018
Int. Cl.² A47C 23/04, 25/00
U.S. Cl. 5—255 13 Claims



1. A spring assembly comprising,

a plurality of rows of coils, each of said rows of coils being formed from a continuous length of wire, segments of wire interconnecting adjacent coils in each of said rows, said segments each being substantially Z-shaped and disposed alternately in first and second planes generally perpendicular to the axis of said coils at the ends thereof, portions of said Z-shaped segments extending beyond the periphery of said coils, said Z-shaped interconnecting segments each generally defining a rectangle of width greater than the maximum diameter of said coils, adjacent coils within each of said rows being situated at diagonally opposite corners of said rectangles, the axes of coils in each of said rows thereby being disposed alternately in two offset parallel planes,

sections of each of said Z-shaped interconnecting segments of each row being overlapped relative to Z-shaped interconnecting segments of adjacent rows,

helical spring means extending parallel to said rows for the length of said rows, said helical spring means being wound through said overlapped sections of said Z-shaped interconnecting segments so as to secure said rows of coils in an assembled relation, and

said overlapped sections of said Z-shaped interconnecting segments being radiused, the radii of said overlapping sections being substantially greater than the radius of said helical wire so that said helical wire permits relative pivotal movement between said overlapped sections of said Z-shaped interconnecting segments of said rows but precludes all other relative movement.

3,911,512

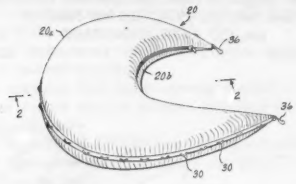
CUSHIONED FURNITURE

Richard W. R. Plate, Frankenburg, Germany, assignor to Knoll International, Inc., New York, N.Y.

Filed Nov. 15, 1973, Ser. No. 415,996
Int. Cl.² A47C 23/00, 13/00
U.S. Cl. 5—352 8 Claims

1. A cushion useful in making an item of furniture comprising a crescent-shaped cushion having a curved outside edge and a curved inside edge meeting at two ends of the cushion, said cushion being generally oval in sections taken substantially perpendicular to the curved edges of the cushion and in which the areas of the oval sections decrease from the central portion of the cushion to the ends thereof, a plurality of indi-

vidual fastening members positioned along said outside cushion edge, and a complimentary fastener of the type adapted to



coact with one of said fastening members and located generally at each of said two cushion ends.

3,911,513

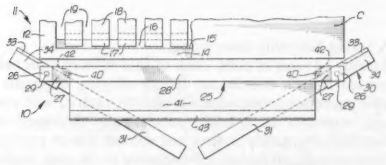
BEEHIVE OPENING TOOL

Paul W. Pierce, 1630 W. 9th St., Upland, Calif. 91786

Filed Feb. 7, 1974, Ser. No. 440,499

Int. Cl.² A01K *51/00*

U.S. Cl. 6—12 R **7 Claims**



1. A beehive opening tool comprising:

a crossbar approximately co-extensive in length with the front end of a beehive which said tool is designed to open; relatively thin wedge means having rearwardly extending handles and pivotally mounted on vertical axes on end portions of said bar said wedge means, when swung inwardly towards each other in the horizontal plane at which two superposed supers of said hive meet, penetrate between said supers and wedge said supers apart by the thickness of said wedge means, said handles then serving as levers when rocked vertically, to exert an upward prying action through said wedge means to pry said supers further apart.

3,911,514

RAFT MATERIALS FOR AQUATIC CULTIVATION

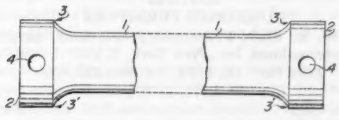
Hideo Ito, Sapporo, Japan, assignor to Sumitomo Bakelite Company Limited, Tokyo, Japan and Hokkai Taiyo Plastic Co., Ltd., Sapporo, both of, Japan

Filed June 1, 1972, Ser. No. 258,573

Claims priority, application Japan, June 5, 1971, 46-39033

Int. Cl.² B63B *21/52*

U.S. Cl. 9—8 R **7 Claims**



1. A raft material for aquatic cultivation consisting essentially of a hollow tubular body made of a synthetic resin whose both ends are sealed into transverse flat portions, with each of said flat portions having a hole therethrough and with each of said flat sealed portions extending beyond the hole both longitudinally inward toward said hollow tubular body and transversely toward the side edges, and which has such a shape that the diameter of the tubular body is smaller than the transverse dimension of each flat portion, but is larger in thickness than the thickness of each flat portion.

3,911,515

LINE PROJECTION APPARATUS

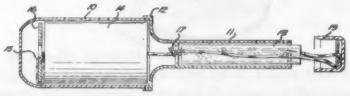
John Henry Temple Rinfret, and Elizabeth Margaret Rinfret, both of The Grange, West Ashby, England

Filed June 18, 1974, Ser. No. 480,558

Claims priority, application United Kingdom, June 19, 1973, 28950/73

Int. Cl.² B63C *9/26*

U.S. Cl. 9—14 **5 Claims**



1. A life saving projectile having a cavity in which is contained a reel of line, one end of the reel being accessible through a hole in the projectile, the reel being arranged to pay out behind the projectile when the projectile is projected and said one end retained at the point of projection, a hollow handle on the projectile through which the line passes and the line being accessible through the handle, there being an elongated rod which is a push fit in the handle and which can be used to project the projectile by a swinging or flicking action.

3,911,516

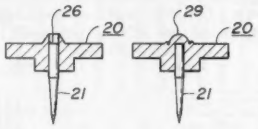
METHOD OF FORMING A PUSH PIN ARTICLE

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

Filed July 16, 1974, Ser. No. 489,051

Int. Cl.² B21G *5/00*

U.S. Cl. 10—161 **7 Claims**

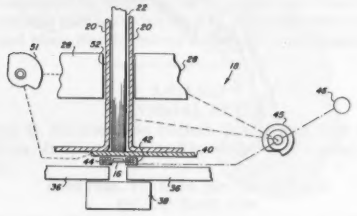


1. A method for producing an article of the type including a base member having first and second opposite surfaces, and a pin projecting from said second surface, comprising, forming said base member with a substantially uniform diameter hole extending between said first and second surfaces, inserting the sharpened end of a pin in said hole from the end thereof at said first surface, said pin having a sharpened end, a blunt end a shank portion between said ends of substantially uniform diameter, said diameter slightly exceeding the diameter of the hole, and pushing said pin into said base member until said blunt end is positioned between said first and second surfaces, and flowing the material of said base member at said first surface surrounding said hole into said hole, whereby the portion of said hole between the blunt end of said pin and said second surface becomes substantially completely filled with the material of said base member.

3,911,517
PUSHER LINKAGE, INSERTER

Robert A. Davis, Clearwater, Fla., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1973, Ser. No. 392,826
Int. Cl.² B32B 3/02
U.S. Cl. 11—1 R 14 Claims



1. Bookforming apparatus comprising:

structure, housing mechanism for effecting intimate contact between a binding strip and the edge of a plurality of pages to be formed into a book whereby said binding strip becomes affixed to said page edges, said mechanism being adapted to automatically proceed through a predetermined sequence of operations;

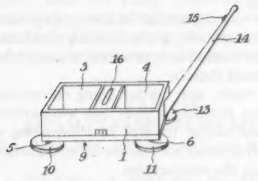
means for automatically presenting said binding strip, at a predetermined time in the sequence of operation, to said mechanism, said presenting means comprising a cartridge containing a length of binding strip material sufficient to provide a plurality of strips, and means for feeding said strip material from said cartridge and cutting same to present said binding strips to a first position relative to said mechanism; and

means for moving each binding strip to a second predetermined position whereby the binding strip is directly in alignment with the page edges to which it is to be affixed.

3,911,518
FLOOR CLEANING DEVICE

Gerald L. Momy, Dorval, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 7, 1974, Ser. No. 448,901
Int. Cl.² A47L 11/03
U.S. Cl. 15—50 R 2 Claims



1. A floor cleaning device, comprising

a housing having an electric motor mounted therein;

a pair of spaced open tubs formed in the housing for storing hot water and cold water, respectively;

a plurality of substantially vertically positioned axles rotatably mounted in the housing and extending from the bottom thereof, each of the axles being drivably coupled to the motor;

a plurality of brush type accessories each adapted to be removably coupled to a corresponding one of the axles for rotation therewith;

a handle affixed to the housing for guiding the housing along a floor;

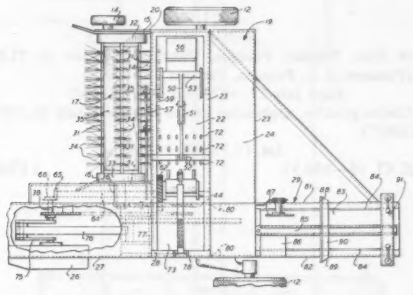
mop holding means on the handle for removably holding a mop thereon; and

wringer means in the housing for wringing a mop.

3,911,519
LEAF COLLECTOR AND BALER

Carl J. Anlas, 2394 Sycamore St., Manasquan Park, N.J. 08736, and Alfred J. Sellari, 93 Meacham St., Nutley, N.J. 07110

Filed Mar. 1, 1973, Ser. No. 337,001
Int. Cl.² E01H 1/04
U.S. Cl. 15—83 16 Claims



1. In a leaf collector and baler having a mobile chassis, a pick-up brush assembly housing mounted on the chassis, a pick-up brush mounting assembly rotatably mounted on the said housing, a leaf collection hopper having a discharge opening on one end mounted on the chassis positioned rearwardly of the said housing so as to receive leaves from brushes on the brush mounting assembly, a compaction chamber having an opening on one side communicating with the discharge opening in the said hopper, the compaction chamber having a discharge opening on one end, a ram mounted for reciprocation in the compaction chamber past the opening communicating with the said hopper, a discharge chute communicating at one end with the discharge opening in the compaction chamber composed of a pair of spaced apart side walls and having a discharge opening at the opposite end, bale tying means operatively positioned in the discharge chute proximal to the discharge opening in the compaction chamber, drive means for rotating the brush mounting assembly, and drive means for reciprocating the ram, comprising:

a. a plurality of generally horizontal brush mounting bars mounted to and for rotation with the brush mounting assembly, the said bars being positioned circumferentially about and displaced radially outwardly from the axis of rotation of the brush mounting assembly,

b. resilient brush filaments attached to the said bars along their length extending generally radially outwardly from the axis of rotation of said brush mounting assembly,

c. a plate mounted on each of said bars extending generally along its length and extending generally toward the next adjacent bar opposite the direction of rotation of the brush mounting assembly,

d. a pair of spaced-apart sweeps operatively mounted on the collection hopper, the respective sweeps reciprocating across the floor of the hopper in the direction of and at different distances from the compaction chamber and substantially above the floor of the hopper in the opposite direction,

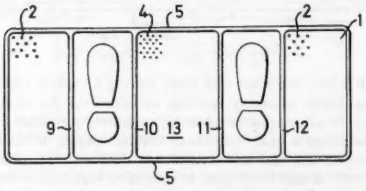
e. timing means operatively connected among the respective sweeps and the ram, positively timing the reciprocation of the sweeps both with respect to each other and to the reciprocation of the ram,

f. the collection hopper having openings in its bottom generally proximal to the collection chamber,
g. the compaction chamber having an opening in its side wall distal to the collection hopper,
h. opposed bale tensioning means on the side walls of the discharge chute proximal to the compaction chamber,
i. a top plate on the discharge chute proximal to the compaction chamber extending at least from the mid-line of the discharge chute to the side wall distal to the collection hopper, the remainder of the side walls of the discharge chute having no substantial bale tensioning means,
j. a floor on the discharge chute extending from the compaction chamber to the discharge end of said chute, the said floor having opposed longitudinally elongated openings proximal to the respective side walls of said chute.

3,911,520
DOOR MAT

Earl Silas Tupper, Panama, Panama, assignor to TUP!-(Panama) S.A., Panama, Panama

Filed July 27, 1973, Ser. No. 383,319
Claims priority, application United Kingdom, July 28, 1972, 35336/72
Int. Cl.² A47L *23/26*
U.S. Cl. 15—104.92 **1 Claim**



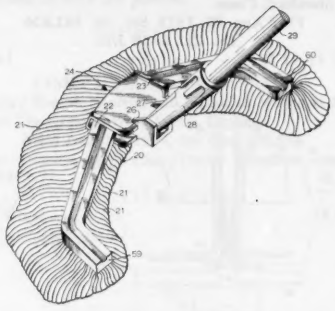
1. A door mat formed as a molded expanse of resilient material, comprising a raised rim surrounding a portion of the mat, a plurality of upwardly extending flexible spikes located within the rim, whereby water can be held within the rim with said spikes extending above its effective surface in use, further upwardly extending flexible spikes located over part of the surface of the mat outside the rim for gross dirt removal and being less deformable then the flexible spikes within the rim, and one or more plain areas on which the user can stand with one foot so as to avoid permanently deforming the said further upwardly extending spikes.

3,911,521
SWING-WING DUST MOP

Douglas W. Franchot, New York, N.Y., assignor to The Drackett Company, Cincinnati, Ohio

Filed Jan. 4, 1974, Ser. No. 430,817
Int. Cl.² A47L *13/255*; B25G *3/38*
U.S. Cl. 15—229 B **10 Claims**

7. A cleaning implement comprising:
an elongated array of fabric-type material for removing dust and dirt;
a single flexible vane to which the fabric-type material is secured and along which the material extends;
a pair of oppositely extending rotatable arm members to which the flexible vane is mechanically secured and along the combined length of which the vane extends as the arm members are rotated;
coupling means for positively connecting the arm members to one another to rotate in opposite directions; and
bracket means for mounting said arm members, containing said coupling means and connecting said arm members to a handle with socket means, wherein said bracket means has apertures therein for receiving detents on said arm

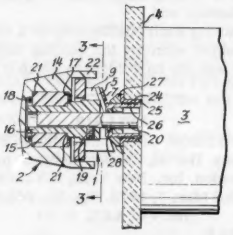


members to position said arm members in a plurality of releasable positions.

3,911,522
WINDSCREEN WIPERS

Edward Donald Wynn, and Denis James Kirkby, both of Charlton Kings, Cheltenham, England, assignors to Wynstruments Limited, Gloucester, England

Filed July 10, 1974, Ser. No. 487,281
Claims priority, application United Kingdom, July 11, 1973, 33013/73
Int. Cl.² B60S *1/44*
U.S. Cl. 15—250.22 **4 Claims**



1. A device for continuously removing liquid from a windscreen, comprising:
drive means for rotating a blade at a wiping speed such that the blade becomes effectively invisible; a blade support guidance and rotation hub attached to said drive means for being rotated thereby;
a carrier for a blade, said carrier being connected to said hub and being positioned over the windscreen, means supporting said carrier for free rotation along with said hub and for free axial movement of said carrier toward and away from the windscreen;
a cam connection between said hub and said blade carrier, comprising driving dogs on said hub extending rearwardly toward said carrier; one surface of each said dog being inclined from said axial movement of said carrier, slots correspondingly spaced around and shaped to said dogs on said carrier into which said dogs extend and a cooperating wall that defines each said slot cooperating and engaging with said inclined surface of the respective one of said dog;
at least one blade of unitary construction connected to said carrier to be rotated thereby and to move and shift therewith; the entire said blade being formed of a transparent material; said blade having an integrally formed leading

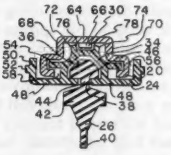
. edge which is on the front of said blade with respect to the motion of said blade; said blade being so disposed and arranged that during rotation thereof said integrally formed blade leading edge contacts the windscreen to scrape liquid therefrom;

whereby when said hub is rotated, said carrier and said blade are urged axially against the windscreen and said walls defining said slots ride up said dogs, while when rotation of said hub is ceased, said blade carrier returns automatically to the inoperative position of said blades wherein said walls of said slots ride down said dogs and said blade thereby moves away from the windscreen.

3,911,523
UNIVERSAL REFILL

William H. Harbison, and Michael G. Mohnach, both of Merrillville, Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 11, 1974, Ser. No. 449,830
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 **5 Claims**



4. An elongate backing member adapted to be attached to a superstructure for holding a flexible windshield wiping element, comprising,

a. a tubular receiver having a longitudinal chamber for holding a retention bead on said wiping element,

b. the bottom of the receiver having a relatively narrow longitudinal slot opening into the chamber,

c. a pair of opposed flanges extending laterally outwardly in opposite directions from the bottom of the receiver,

d. a second pair of opposed flanges extending laterally outwardly in opposite directions on the receiver in vertically spaced relation above said first flanges to define laterally opening slots for receiving the claws of a superstructure, and

e. a pair of spaced apart upstanding ribs formed on the upper surface of and extending throughout the length of said tubular receiver for adding stiffness to said backing member, said ribs being symmetrically disposed with respect to the longitudinal center of said tubular receiver for permitting a projecting member on said superstructure to pass therebetween without interference.

3,911,524
STEAM CLEANER DUMP BUCKET

Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.

Filed June 3, 1974, Ser. No. 476,029
Int. Cl.² A47L *9/10, 9/20*
U.S. Cl. 15—353 **13 Claims**

8. A dump bucket for a steam cleaner, said dump bucket comprising:

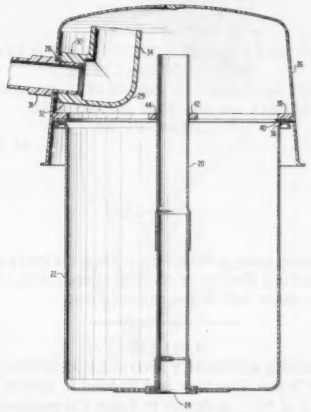
a. an upwardly open, lower, cup-shaped member having an aperture in the bottom thereof, the upper edge of said upwardly open, lower, cup-shaped member hereinafter being referred to as the lip thereof;

b. a hollow riser tube extending upwardly from the aperture in said lower cup-shaped member;

c. a downwardly open, upper, cup-shaped member adapted to releasably engage said lower cup-shaped member in an air-tight seal, said upper cup-shaped member having an aperture in the side thereof;

d. a connector;

e. means for mounting said connector in the upper cup-shaped member adjacent to and in alignment with said aperture, the combination of said means and said connector constituting a path of fluid communication between the exterior and the interior of said upper cup-shaped member, said connector comprising a generally horizontal portion and a generally vertical portion, the generally vertical portion of said connector having an inner surface portion which is positioned in the path of incoming fluid from the horizontal portion,



located within said upper cup-shaped member, and oriented to deflect upwardly fluid coming into said upper cup-shaped member through said connector; and

f. a diametrically extending strut joining opposite sides of the inner surface of the top of said upper cup-shaped member whereby, if a vacuum is applied to the aperture in said lower cup-shaped member and a steam cleaner vacuum wand is connected to the exterior end of said connector, dirty water will be forced through said connector and sprayed against the inner surface of the top of said upper cup-shaped member, after which it will run down the sides of said upper and lower cup-shaped members without going down said hollow riser tube.

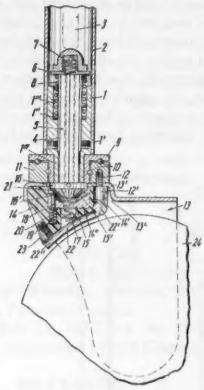
3,911,525
CASTOR, PARTICULARLY FOR HOSPITAL BEDS

Berthold Haussels, Wermelskirchen, Germany, assignor to Firma Acousa Saxon, S.A., Germany

Filed Aug. 26, 1974, Ser. No. 500,535
Claims priority, application Germany, Sept. 1, 1973, 2344208
Int. Cl.² B60B *33/00*
U.S. Cl. 16—35 R **13 Claims**

1. A centrally locatable castor, particularly for hospital beds, with a fixing pin for mounting at the foot of a bed and carrying a castor fork and a roller by means of a ball bearing, having a polyhedral adjusting bolt which is carried axially through and non-rotatably in the fixing pin and which can be moved axially by means of a central adjusting linkage against the influence of a counter-spring which urges the bolt towards its upper position, the adjusting bolt having at its bottom end an adjusting disc projecting into the castor fork and engaging at a predetermined position of the adjusting bolt with a direction control member which prevents displacement due to swivelling and engaging at the lowest position with a brake unit freely mounted in the fork for preventing both displacement by swivelling and also movement of the roller, wherein

a brake unit is provided which encloses an adjusting disc below and at the side and also encloses a counter-disc located under and arranged for engagement with the adjusting disc, a



retaining spring being arranged for holding the brake unit and being located in a position of constant contact with either the back of the castor fork or the adjusting disc.

3,911,526

DOOR CLOSER ASSEMBLY AND SELF-ALIGNING STOP

Charles B. Christy, Charlotte, and Richard L. Zunkel, Marshville, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 21, 1974, Ser. No. 525,700
Int. Cl.² E05F *3/00*
U.S. Cl. 16—49 **11 Claims**

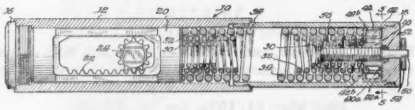
1. In a non-handed door closer assembly the door elements including a door and a frame, the door closer assembly including a main arm mounted for rotation relative to one of said door and frame, a secondary arm pivotally connected to said main arm, means mounting said secondary arm to the other of said door and frame for relative rotation therewith, and stop means associated with said mounting means for limiting rotation of said secondary arm with respect to said mounting means when said secondary arm reaches a predetermined orientation relative thereto, said stop means comprising a frame portion mounted to be freely rotatable about an axis fixed with respect to said mounting means, rotation of said frame portion defining a plane generally parallel to the planes of rotation of said main arm and said secondary arm, said stop means further comprising a stop portion projecting from said frame portion in a direction oppositely disposed from said mounting means, said stop portion including a stop surface disposed to engage said secondary arm when said secondary arm reaches said predetermined orientation, said stop surface being transversely disposed from said axis.

3,911,527

SPRING ADJUSTMENT MECHANISM

Thomas R. Lasier, Princeton, Ill., assignor to LCN Closers, Princeton, Ill.

Continuation of Ser. No. 189,316, Oct. 14, 1971, abandoned.
This application Feb. 15, 1974, Ser. No. 442,742
Int. Cl.² E05D *3/06*
U.S. Cl. 16—64 **4 Claims**



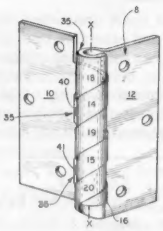
1. An adjustable spring loading mechanism comprising:
a cylinder housing;
a piston slidable in said cylinder; and
an adjustable biasing mechanism for urging the translation of said piston in said cylinder comprising a plurality of substantially concentric compression springs extended within said cylinder in connection with said piston and arranged to apply individual biasing forces to said piston which cooperate to produce a resultant piston-driving force, a plurality of load adjustment members positioned for translation within said housing and telescoped together adjacent one end of said springs, said load adjustment members being further arranged with one member in axial alignment with each spring for engagement therewith, and adjustment means to selectively telescope said members axially within said housing to apply a pre-load force to the associated spring which varies the individual biasing force of said spring and thereby varies the resultant piston-driving force.

3,911,528

INVOLUTE PINLESS HINGE

Richard Rojic, Sr., 20 W. 176 Edward St., Lombard, Ill. 60148

Filed Oct. 31, 1974, Ser. No. 519,418
Int. Cl.² E05D *9/00*, *15/00*
U.S. Cl. 16—128 R **8 Claims**



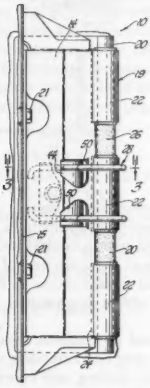
1. A pinless hinge comprising:
first and second leaves operatively disposed to pivot about a common axis;
each of said leaves comprising a plurality of spaced apart members;
said members of each leaf defining bearing surfaces alternately disposed along their entire length at acute and obtuse angles to said common axis; and
said members of said first and second leaves disposed in intertwining relation with each other to effect spiral-shaped whorls interlocking said leaves one with the other such that the bearing surfaces of one said leaf are dis-

posed in mating relation with the corresponding bearing surfaces of said other leaf whereby said leaves are interlockingly joined to permit articulate motion of said leaves about said common axis.

3,911,529
DOOR HINGE ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,253
Int. Cl.² E05D *11/08*
U.S. Cl. 16—142 11 Claims

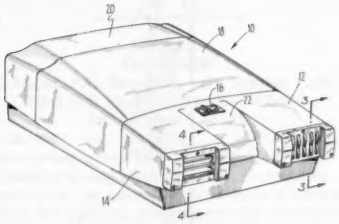


1. A programmed hinge assembly comprising: a first hinge plate, a second hinge plate, a hinge joint pivotally connecting said hinge plates, a spring arm between said hinge plates for defining at least one stop position; said spring arm including an anchored portion fixed to said first hinge plate, a control portion including at least one detent in controlling engagement with said second hinge plate, and a connecting portion, said connecting portion partially surrounding the outside of said hinge joint such that said spring arm substantially encompasses said hinge joint.

3,911,530
SYSTEM AND METHOD FOR REMOVING FEATHERS FROM DUCKS AND OTHER FOWL

James S. Kalfsbeek, 8th and Elm Sts., College City, Calif. 95931, and Peter C. Kalfsbeek, Rte. 1, Box 123, Williams, Calif. 95490

Filed Feb. 5, 1973, Ser. No. 329,520
Int. Cl.² A22C *21/02*
U.S. Cl. 17—11.1 R 7 Claims

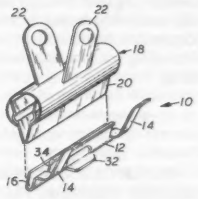


1. A feather plucking head comprising:
a grating having longitudinal slots bounded by relatively closely-spaced continuous longitudinal members;
a pair of juxtaposed driven rollers having radially grooved surfaces, said grooves corresponding to the longitudinal members of the grating and said rollers located such that the roller surfaces between the grooves extend into the longitudinal slots in the grating;
suction means adapted to draw the feathers of a fowl placed against the grating between the rollers; and
means for intermittently engaging the roller surfaces between the grooves of the juxtaposed rollers, said roller surfaces being disengaged more than engaged so that the intermittent engagement thereof grasps feathers drawn between the rollers by the suction means to snap them off the fowl with a plucking action.

3,911,531
ATTACHABLE PENCIL HOLDER FOR PAPER RETAINING CLAMP

John Buturuga, 1711 Plunkett St., Hollywood, Fla. 33020

Filed Oct. 18, 1974, Ser. No. 515,835
Int. Cl.² B43K *25/00*
U.S. Cl. 24—10 2 Claims

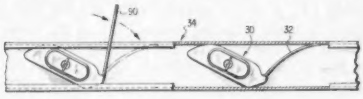


1. A writing instrument retaining device removeably engageable with a paper clamp for resiliently retaining a writing instrument such as a pen or pencil against a portion of said clamp body, said clamp including a pair of paper clamp legs, said writing instrument retaining device comprising:
a body having an elongated, blade engaging channel, said channel having a pair of walls joined substantially in a U-shape, said body channel sized for connecting said body to one of said paper clamp blades, said body including a pair of resilient arms, each arm disposed at opposite ends of said body channel, each arm having a lower portion connected to one of said channel walls, said lower portion substantially perpendicular to said channel wall and said arm having an upper portion adjacent the free end of said arm substantially parallel to said channel wall, said pair of arms forming a writing instrument retainer for retaining a writing instrument adjacent one of said clamp blades.

3,911,532
AUTOMOTIVE TRIM STRIP FASTENER

Donald Trower, 3069 N. Parkview Drive, Fresno, Calif. 93705

Filed May 21, 1974, Ser. No. 472,056
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 BC 2 Claims



1. An automotive trim strip fastener comprising, in combination:
a substantially flat body member of thin stock having a centrally disposed opening and a tapered end portion, said body member having a substantially flat upper edge and a substantially flat lower edge, said upper and lower

edges being substantially parallel, said body member having an arcuate end edge curving downwardly from said upper edge substantially to said lower edge and having a rounded nose smoothly merging said arcuate end edge with said lower edge, that end of said body member opposite said tapered end portion having a first end edge sloping downwardly from said upper edge and a second edge sloping upwardly from said lower edge, said first and second end edges defining a neck between them, and a tail piece integrally joined with said neck and projecting laterally upwardly with respect thereto so that said tail piece and said body member define a V-shape, said tail piece being of a length substantially equal to that of said body member and being integrally joined with said neck portion along a bend line extending transversely of said neck portion such that said tail piece lies in a plane substantially perpendicular to a second plane containing said body member and is offset to one side of said second plane, and the central region of said body member surrounding said central opening being deformed outwardly from said second plane to that side thereof opposite the one side to which said tail piece is offset; and

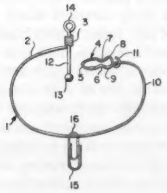
a wire clip assembly engaged through said central opening, said wire clip assembly having a head portion seated within the depression provided by the deformed central region and including resilient legs projecting through said central opening.

3,911,533

PAPER CLIP HOLDER

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed Mar. 4, 1974, Ser. No. 448,163
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 C **7 Claims**



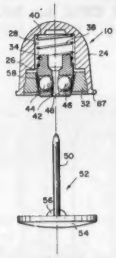
1. A paper clip holder comprising a storage loop (**1**) for paper clips, a left portion (**2**) of said storage loop having a wrapping (**3**), a shank member (**12**) slidable through said wrapping, a lower retaining means (**13**) on the lower end of said shank member and an upper retaining means (**14**) on the upper end of said shank member, a right portion (**10**) of said storage loop culminating in a retaining loop (**4**), said retaining loop including a left portion (**5**) smaller than said retaining means on the lower end of said shank member, said retaining loop (**4**) including a right portion (**8,9**) larger than said retaining means (**13**) on the lower end of said shank member whereby said lower end of said shank member may be passed vertically therethrough, said retaining loop (**4**) further including means (**11**) encircling said right portion (**10**) of said storage loop for a connection therewith.

3,911,534

ANTI-THEFT FASTENING DEVICE

Henry J. Martens, Lynnfield, and Jan Vandebult, Topsfield, both of Mass., assignors to I. D. Engineering, Inc., Peabody, Mass.

Filed Oct. 30, 1974, Ser. No. 519,270
Int. Cl.² A44B *9/00*; G08B *13/00, 21/00*
U.S. Cl. 24—150 R **5 Claims**



5. A fastening device comprising:

a. a generally cylindrical non-metallic housing closed at one end and formed with a central opening and a relatively enlarged recess at the open end of said housing;

b. a ring mounted in said recess in said housing, said ring being formed with a downwardly and inwardly tapered inner surface;

c. an insert formed of magnetic material loosely received within said housing and extending upwardly substantially into said central opening, said insert being formed with an axial bore, and at least one transverse opening formed in the lower end of said insert;

d. a pin extending upwardly through said axial bore of said insert;

e. retaining ball means disposed within said transverse opening of said insert, and

f. spring means for resiliently biasing said insert toward the open end of said housing thereby adapting said ball means to engage said ring and tightly frictionally engage said pin and retain the same in said insert.

3,911,535

BLOCKING DEVICE FOR A VEHICLE BELT

Gerard Mauron, Versailles, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Nov. 29, 1974, Ser. No. 528,571
Claims priority, application France, Dec. 3, 1973, 73.43041
Int. Cl.² A44G *11/06*; A47C *31/00*
U.S. Cl. 24—170 **5 Claims**

1. A blocking device for a belt and in particular a vehicle safety belt, the device comprising a support, a fixed member

fixed relative to the support and a movable member movable between a first position in which it is spaced sufficiently away from the fixed member to allow the belt to move longitudinally freely between said members and a second position in which the movable member clamps the belt against the fixed member, an arrangement of articulated links, pivotally interconnecting said members in such manner as to result in an increased clamping of the movable member against the belt when the clamping has been initiated, supplementary guide means along which and in contact with which guide means the belt is movable, said guide means being pivotable relative to the support and operatively connected to the movable member, and resiliently yieldable means for normally maintaining the guide means in such position that the belt is transversely deviated and longitudinally defines a broken line so that under the effect of a traction exerted on the belt which renders the belt taut, the belt urges back the guide means in opposition to the action of the resiliently yieldable means, the operative connection of the guide means to the movable members being such that the guide means is capable of bringing the movable member to said second position when urged back by the belt.

3,911,536
SLIDE FASTENERS HAVING A SEPARABLE END CONNECTION

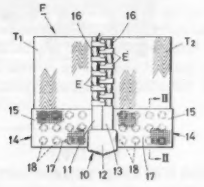
Eizo Shimotani, and Tadashi Sumiyoshi, both of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1974, Ser. No. 449,196

Claims priority, application Japan, Mar. 20, 1973, 48-34175

Int. Cl.² A44B *19/36*

U.S. Cl. 24—205.11 F **2 Claims**



1. In a slide fastener comprising a pair of opposed stringer tapes each carrying along one longitudinal edge a series of interlocking fastener elements, a separable end connection extending beyond the endmost fastener elements on the tapes and including a reinforcing strip adhesively applied and bonded to an end portion of each tape at alternate stiff surface bonding regions and soft surface bonding regions, said stiff bonding region being more strongly bonded to each tape than said soft bonding regions, and a separator secured to said edges of the tapes at said end portion, said stiff and soft surface bonding regions being each of limited area and disposed in spaced-apart relation to one another in generally all directions.

3,911,537
FASTENER

Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262

Filed Oct. 29, 1973, Ser. No. 410,486

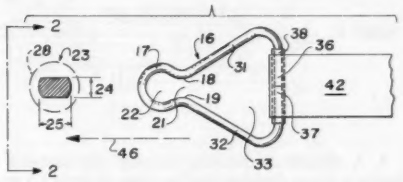
Int. Cl.² A44B *21/00*

U.S. Cl. 24—245 **5 Claims**

1. A snap-acting swivel fastener comprising:

a ring member having an arcuate portion extending circumferentially in an amount greater than a semicircle to define a first opening, said ring member converging from said arcuate portion to define an entryway to said first opening of a width less than the diameter of said first opening, and said ring member diverging from said entryway to define a second opening larger than said first opening, and said ring member being formed of a resilient material for expandable outward displacement of said entryway; and

a stud having a neck portion mounted to extend through said first opening and a head portion dimensioned to retain said ring member against withdrawal axially from said first opening but to permit withdrawal axially from said second opening, said neck portion having a non-circular cross-section with a narrow width dimension and an angularly displaced larger width dimension, said narrow



width dimension being greater than the width of said entryway but small enough to allow said narrow width dimension of said stud to be aligned with and urged through said entryway by resiliently outwardly displacing said entryway, said larger width dimension being less than the diameter of said first opening so as to rotatably fit therein and being large enough to prevent passage of said stud through said entryway for substantially all angular positions of said stud with respect to said entryway except upon alignment of said narrow width dimension with said entryway.

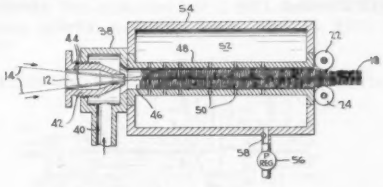
3,911,538
APPARATUS FOR TEXTURIZING A PLURALITY OF YARNS SIMULTANEOUSLY

Roger Vidal, Champagne, and Raymond Gourmandy, Lyon, both of France, assignors to Rhone-Poulenc-Textile S.A., Paris, France

Division of Ser. No. 188,775, Oct. 13, 1971, Pat. No. 3,827,113. This application Dec. 21, 1973, Ser. No. 427,343

Int. Cl.² D02G *1/12*

U.S. Cl. 28—1.6 **4 Claims**

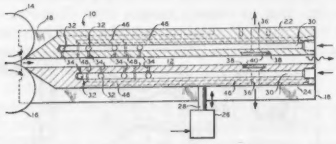


1. A texturizing device for simultaneously texturizing a plurality of yarns and maintaining separability of said yarns during the texturizing thereof, comprising an elongated hollow member disposed about an axis and having an inlet, an outlet, and a plurality of lateral discharge apertures; and nozzle means communicating with said inlet of said hollow member, said nozzle means including intake means for receiving a hot, compressed fluid and conduit means aligned with the axis of the hollow member for receiving said plurality of yarns, said conduit means including supply means for receiving individual ones of said plurality of yarns and delivering said plurality of yarns separately to said hollow member, and said supply means converging toward the axis of said hollow member to converge the individual yarns toward the axis of said hollow member while maintaining separation of the yarns as the yarns are delivered.

3,911,539
METHOD FOR CRIMPING SYNTHETIC THERMOPLASTIC FIBERS

James K. Hughes, Guayama, P.R., and Wayne K. Erickson, Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 29, 1972, Ser. No. 319,136
Int. Cl.[2] 68 *5 D*; D02G *1/12*
U.S. Cl. 28—72.14 12 Claims

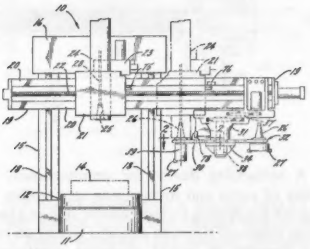


1. A method of crimping synthetic thermoplastic fibers having a drawn denier within the range of from 1.5 to about 80 dpf, to produce crimped fibers having an improved crimp recovery, which method comprises crimping said fibers in the presence of steam by passing same under crimping conditions through a crimping zone comprising a defined first region of low but increasing steam pressure which increases over said first region from substantially atmospheric pressure to a value within the range of from 5 to about 35 psig, a defined second region of relatively high and substantially constant steam pressure within the range of from at least 5 to about 35 psig, and a defined third region of decreasing steam pressure which decreases in said third region from a value within the range of from 5 to about 35 psig to substantially atmospheric pressure, and recovering crimped fibers having a crimp frequency within the range of from 5 to 15 crimps per inch and a crimp recovery of at least about 12.5 percent.

3,911,540
TOOL INTERCHANGE SYSTEM WITH BREAK-AWAY SHOES

Earl E. Johnson, and Calvin Gladoske, both of North Fond du Lac, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Mar. 16, 1973, Ser. No. 341,971
Int. Cl.[2] B23Q *3/155*
U.S. Cl. 29—26 A 14 Claims



1. A tool interchange system for a machine tool comprising

a. a tool storage magazine formed with at least one socket recess,

b. tool support means within each socket recess for removably receiving and supporting a tool,

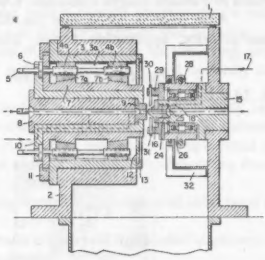
c. tool engaging means for engaging a tool held by said tool support means, removing said tool from said magazine for use in a machining operation, and returning the tool to said magazine upon completion of a machining operation, and

d. yieldable and frangible connecting means for securing said tool support means within each socket recess, said connecting means when subjected to a force having a yielding point below that of said tool support means and said magazine for permitting said tool support means to be moved relative to said socket recess in the event of unintended overtravel of said tool engaging means during a tool removal or return operation prior to said tool engaging means exerting a force on said tool support means of a magnitude that would damage said magazine or tool engaging means.

3,911,541
STRIPPING A SURFACE LAYER FROM AN ELONGATED METAL MEMBER SUCH AS A WIRE OR ROD

Gerhard Ziemek, Hannover; Harry Staschweski, Langenhagen, and Kurt Mueller, Hannover, all of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Germany

Filed Feb. 6, 1974, Ser. No. 440,243
Claims priority, application Germany, Feb. 10, 1973, 2306602
Int. Cl.[2] B23P *25/00*
U.S. Cl. 29—33 F 6 Claims



1. Apparatus for continuously stripping the surface of an elongated metallic member, comprising

an elongated guide means having an aperture therethrough for the continuous passage of an elongated metallic member in a longitudinal path, said aperture having a cross section such that said elongated guide engages said metallic member over an extended longitudinal length for straightening said metallic member as it passes therethrough,

draw die means fixedly attached to the output end of said elongated guide means and axially aligned with said aperture therethrough, said draw die means having a die cross section smaller than that of said guide aperture for reducing the cross section of the elongated metallic member, immediately upon said elongated metallic member being straightened, for the initial removal of minor surface defects;

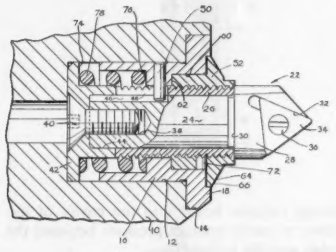
cutting means comprising a shaving die axially aligned with said longitudinal path and positioned at a maximum distance of about 6 mm from the output end of said draw die means for stripping a surface of said elongated member immediately after it has been reduced in cross section by said draw die means; and

chip clearing means comprising a clearing tool adapted to be revolved about said cutting means, said clearing tool being positioned laterally a distance removed from the input end of said cutting means and the surface of the elongated metallic member by no more than amout 5 mm, so as to engage the accumulation of chips of minute thickness extending from the input of said cutting means.

3,911,542
ADJUSTABLE TOOL UNIT

Ernest J. Friedline, Latrobe, and Edward L. Sorice, Crabtree, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Aug. 12, 1974, Ser. No. 496,624
Int. Cl.² B23B 29/02
U.S. Cl. 29—96 7 Claims

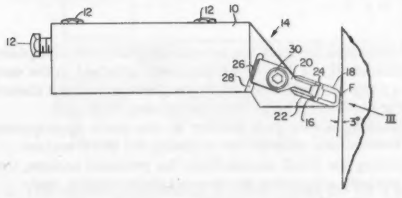


1. In an adjustable cutting tool unit; an outer sleeve having securing means for connection thereof to a support member, a threaded tubular element slidable in the sleeve, a central rod member within the tubular element and having a first end portion protruding from one end of the tubular element, abutment means between said rod member and the said one end of said tubular element, sliding key means holding the tubular element and rod member against rotation in the sleeve, an adjusting nut threaded on said tubular element near said one end of the tubular element, interengaged elements of abutment means on the adjusting nut and the sleeve, a second end portion of the rod member, a spring retainer fixed to the second end portion of the rod member and having a first shoulder facing said sleeve, said sleeve having a second shoulder facing said retainer, and a compression spring bearing between said shoulders.

3,911,543
CUTTING INSERT AND HOLDER

Edward L. Sorice, Crabtree, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 493,560, Aug. 1, 1974, Pat. No. 3,887,974.
This application Feb. 10, 1975, Ser. No. 548,431
Int. Cl.² B26D 1/00
U.S. Cl. 29—96 4 Claims

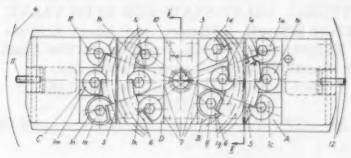


1. In combination; a tool holder having an elongated pocket at one end open toward the front end and one side and the top, an elongated cutting insert in said pocket having cutting edges on the ends with one thereof protruding from the front end of the pocket, said insert having a lateral groove in the top wall, the bottom wall of said pocket and the bottom wall of said insert inclining downwardly toward the closed side of said pocket, said insert being symmetrical about a plane perpendicular to the top wall of the insert and containing the axis of said groove whereby the insert can be reversed end for end for mounting in a second holder which is the mirror image of the first mentioned holder, and a clamp member on said holder parallel to said insert and having a nose portion engaging said groove to clamp the insert in the pocket.

3,911,544
PROFILE-MACHINING TOOL

Reinhold Meisterring, Grunbach, Germany, assignor to Gebr. Saacke K.G., Eutingen bei Pforzheim, Germany

Filed July 16, 1974, Ser. No. 488,931
Claims priority, application Germany, July 27, 1973, 2338146
Int. Cl.² B26D 1/12
U.S. Cl. 29—102 R 4 Claims



1. A tool for machining a profile on a workpiece while the same is held stationary, comprising:

a. a rotary disc, and

b. a plurality of partly circular cutting teeth readjustably mounted on said disc in at least two sets in different positions along the axis of said disc with the first of said sets disposed radially from said axis in an arc of a circle to cut an inside profile of said workpiece and the second of said sets also spaced radially from said axis and substantially concentrically from said first set to essentially simultaneously cut an outside profile of said workpiece with the teeth of said second set being positioned to face the set disposed on the same side of said axis of said disc.

3,911,545
HOB FOR MACHINING GEAR WHEELS

Tsuyoshi Ohashi, Kobe; Hiroshi Taniguchi, Kakogawa; Koichiro Wakihira, Kobe, and Kunio Kakihara, Akashi, all of Japan, assignors to Kobe Steel Ltd., Japan

Continuation-in-part of Ser. No. 235,166, March 16, 1972, abandoned. This application July 5, 1973, Ser. No. 376,366
Claims priority, application Japan, Mar. 16, 1971, 46-14620
Int. Cl. B26d 1/12
U.S. Cl. 29—103 B 10 Claims

1. A hob for machining the teeth of gear wheels comprising: a generally cylindrical body adapted for rotation about its longitudinal axis; and

a plurality of tooth elements projecting from the periphery of said body being arranged in succession according to a preselected pattern along a helical line of revolution extending around said body about its axis,

said tooth elements being classified into two types or sets and each set being formed of different materials, all of the teeth within a first one of said sets being identical to each other in size and profile while all of the teeth within a second one of said sets are also identical to each other in

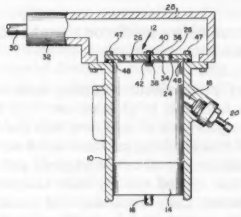
size and profile yet different from all of said teeth within said first set,

said teeth within said first set having a width which is greater than the width of said teeth within said second set whereby only said teeth of said first set are utilized for cutting the faces and flanks of the teeth of a gear wheel to be produced, while said teeth within said second set have a height which is greater than the height of said teeth within said first set whereby only said teeth of said second set are utilized for cutting the bottoms of the teeth of said gear wheel.

3,911,546
METHOD OF FORMING HEAD MEMBER HAVING INTEGRAL VALVE SEATS FOR REED VALVE

Martin Omer Schrock, Baltimore, and Albert Andreas Wilhelmi, Baldwin, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 28, 1974, Ser. No. 484,145
Int. Cl.² B21D *53/00*
U.S. Cl. 29—157.1 R **6 Claims**



1. A method of forming a valve seat for a reed valve of the type having a valve seat disposed about the periphery of a valve port in a head member, and a reed member mounted on one side of the head member in cooperative relationship with said valve seat, said method comprising the steps of:

forming an aperture within sheet metal head stock, said stock having spaced apart parallel surfaces;

providing a first die having a generally planar surface and a recessed area in its generally planar surface of greater diameter than said aperture in said head stock, said recessed area having a smooth surface parallel to the generally planar surface of the die;

placing the stock adjacent to the generally planar surface of the first die with the aperture in the head stock in concentric alignment with the recess in the die; and

deforming peripheral portions of the stock adjacent to the aperture into said recessed area of said first die until the peripheral portions contact the smooth surface of the recessed area to form a raised valve seat having a smooth work hardened surface parallel to the adjacent surface of the head stock.

3,911,547
PROCESS FOR THE PRODUCTION OF POROUS TUBES HAVING SMALL PORES

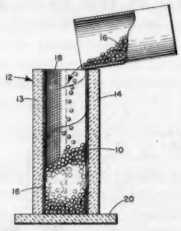
Peter Vinz, Ispra, Italy, assignor to European Atomic Energy Community (Euratom), Luxemburg

Filed Oct. 25, 1973, Ser. No. 409,591
Claims priority, application Luxemburg, Oct. 26, 1972, 66369
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 R **4 Claims**

1. A process for producing porous tubes, said process comprising:

winding at least one strip of commercial metal cloth in an overlaping spiral form to form a hollow member having an inner surface and an outer surface,

bringing the outer surface into contact with a sintering support member having half-shells which enclose said wound strips,



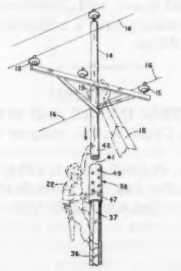
introducing ceramic beads into the cavity of the hollow member to create contact pressure between the hollow member and the half-shells,

sintering the wound cloth and removing the sintered cloth from the support member.

3,911,548
METHOD FOR REPLACING EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

Achilles Perry, Maplewood, N.J., assignor to Interpace Corporation, Parsippany, N.J.

Filed Oct. 2, 1974, Ser. No. 511,173
Int. Cl.² B23P *7/00*
U.S. Cl. 29—401 **25 Claims**



1. A method for replacing an existing utility pole comprising a proximal section having a bottom end attached to the earth and a distal section having hardware thereon, without disturbing the hardware; the method comprising steps of:

Attaching a new pole section to the earth appropriately located and adapted for receiving the distal section.

severing the distal section from the proximal section, temporarily supporting the severed distal section, and

connecting the distal section to project from the new pole section.

3,911,549
METHOD OF FORMING A STACHION ASSEMBLY

Peter Erwin Herr, Johannesburg, South Africa, assignor to Midland Industries, Ltd., Wolverhampton, England

Division of Ser. No. 289,972, Sept. 8, 1972, abandoned. This application Dec. 27, 1973, Ser. No. 428,626
Int. Cl.² B23P *17/00*
U.S. Cl. 29—421 **3 Claims**

1. A method of forming a stanchion assembly having a strengthened joint for a horizontal rail member comprising the

steps of providing a separate hollow bulbous element having at least one hole in the wall thereof, passing an end of a first tubular member into the hole in the bulbous element, expanding the section of the first tubular member enclosed by the bulbous element into conforming contact throughout with the

inner surface of the bulbous element, forming an opening at an angle to the first tubular member through the bulbous element and the first tubular member to receive a second tubular member, and passing the second tubular member through said opening to form the horizontal rail member of a stanchion assembly.

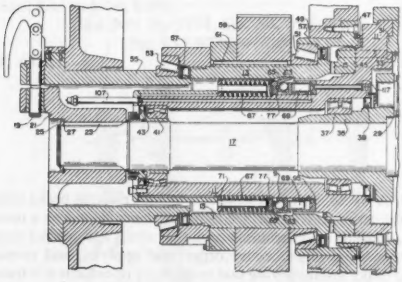
3,911,550
QUICK-CHANGE DIE AND ROLLER ASSEMBLY

Robert W. Gilman, San Francisco, Calif., assignor to California Pellet Mill Company, San Francisco, Calif.

Division of Ser. No. 239,555, March 30, 1972, Pat. No. 3,825,387, and a continuation-in-part of Ser. No. 141,303, May 7, 1971. This application Mar. 25, 1974, Ser. No. 454,147

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **2 Claims**



1. The method of providing a quick change die for a pellet mill, comprising

mounting the die on a removable shaft which is disposed coaxial to a drive shaft and has a plurality of elements mounted on one of said shafts and which can be moved into and out of engagement with a groove on the other of said shafts for interlocking said removable shaft axially with respect to said drive shaft when said elements are engaging said groove,

moving the elements out of engagement with said groove by fluid pressure to release said removable shaft from its axial engagement with said drive shaft, and

removing said shaft, with said die attached thereto, from said mill.

3,911,551
METHODS OF AND APPARATUS FOR LOADING AUTOMATIC HOT TOPPING APPARATUS WITH HOT TOPPING SLABS

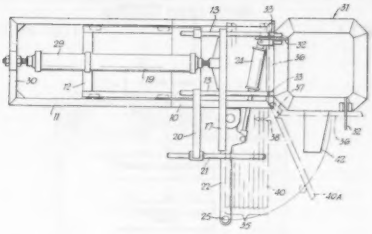
Kenneth Thomas Eccleston, and John George Frizzell, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Division of Ser. No. 260,438, June 7, 1972, Pat. No. 3,815,210. This application Mar. 22, 1974, Ser. No. 453,959

Claims priority, application United Kingdom, June 16, 1971, 28242/71

Int. Cl.² B21D *39/03*

U.S. Cl. 29—428 **4 Claims**



1. In the process of hot topping the steps of

loading a plurality of slabs of refractory heat insulating material into a magazine,

dispensing slabs one-by-one from the magazine while automatically applying the slabs to hot topping apparatus,

locating the hot topping apparatus within an ingot mould or ingot mould head box, and

transferring the slabs from the hot topping apparatus onto the wall of the ingot mould or ingot mould head box.

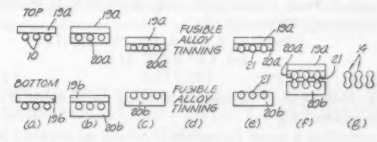
3,911,552
METHOD OF FABRICATING MAGNETOCHEMICAL PARTICLES

Lyne S. Trimble, 4724 Arcola Ave., North Hollywood, Calif. 91602, and Florence A. Ito, North Hollywood, Calif., assignors to Lyne S. Trimble, North Hollywood, Calif., a part interest

Division of Ser. No. 210,077, Dec. 20, 1971. This application Aug. 26, 1974, Ser. No. 500,361

Int. Cl.² B23P *3/00, 25/00*

U.S. Cl. 29—458 **10 Claims**



1. The method of fabricating a magnetochemical particle, which comprises the steps of:

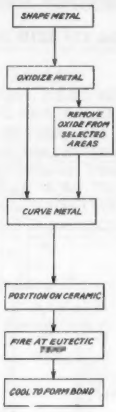
respectively plating each of two masses of ferromagnetic material to provide an inner layer of iron and an outer layer of copper overcoated with a film of nickel-tin; aligning said coated masses so that their magnetic field orientation axes are parallel; and thereafter bonding the oriented masses together to preserve the parallel relationship of said axes.

3,911,553

METHOD FOR BONDING METAL TO CERAMIC

James F. Burgess, and Constantine A. Neugebauer, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,890
Int. Cl.² B23K 31/02
U.S. Cl. 228—173 9 Claims



1. The method of bonding a metallic member to a ceramic substrate comprising the steps of:

heating the metallic member to a temperature below the eutectic temperature of the metal in a reactive atmosphere to form a layer of reacted metal on said member; curving said member so that said layer is on the convex surface of said member;

placing said member in contact with said ceramic substrate; heating said member and said substrate to a temperature above the eutectic temperature of the metal and said layer, and below the melting point of the metal, to provide a eutectic of said metal and said layer, said metal softening so as to unroll and to conform to the surface of said substrate in such a manner as to substantially reduce the possibility of the formation of any voids or bubbles in said eutectic as said eutectic wets the area of contact between said member and said substrate; and

cooling said member and substrate to bond one to the other.

3,911,554

METHOD OF BENDING A LAMINATED BUILDING PANEL AND A CORNER PRODUCED THEREBY

Joseph E. Ford, Connersville, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 2, 1974, Ser. No. 528,723
Int. Cl.² B23K 31/02
U.S. Cl. 29—527.2 11 Claims

1. A method of bending a building panel along a selected line, comprising

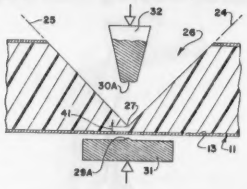
providing a metal facing sheet having an exposed face and a hidden face;

applying a backing to substantially the entire area of said hidden face;

notching said backing to provide a V-notch extending parallel with said selected line and having an apex proximate to said hidden face; and then

indenting said facing sheet segment along said selected line to produce a groove in said exposed face and a complementing bead in said hidden face; and

bending said building panel about said selected line to provide angularly presented panel segments having a common bending edge and such that the inside of said common bending edge is formed from said complementing bead and the outside of said common bending edge is



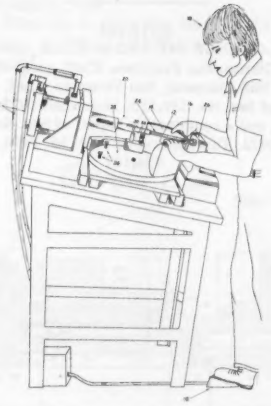
formed from said groove, said groove which is visible prior to bending said panel being substantially imperceptible visually as a concavity after bending said panel.

3,911,555

HORIZONTAL RIVETER

Herman I. Allen, Arrington, and William E. Maffett, Hermitage, both of Tenn., assignors to Fleetline Manufacturing, Inc., Smyrna, Tenn.

Filed Dec. 21, 1973, Ser. No. 427,069
Int. Cl.² B23P 19/00
U.S. Cl. 29—526 6 Claims

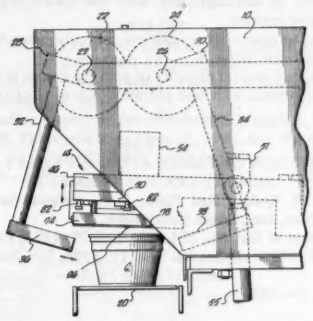


1. A riveting process which comprises riveting brake linings to the outer convex surface of brake shoes placed on a turntable, rotating said turntable such that rivets are applied during said rotating in successive order, and applying said rivets to said brake linings during said rotating by operation of a treadle or foot pedal, whereby a hammer, pneumatically acts against an anvil, thereby inserting said rivets through said linings and into said shoes as said rivets are applied one after another in an arc line along said outer convex surface such that said lining is snugly attached to said surface of said brake shoes, said hammer and anvil being positioned at an angle from horizontal, said turntable being positioned at substantially the same angle from said brake shoes and being substantially parallel to said turntable and said brake shoes being held in place during said applying of said rivets by insertion of at least one projection from the upper surface of said turntable through at least one hole in each of said shoes, thereby allowing the application of each rivet in a different location to be achieved by a rotary movement of the linings and shoes on the turntable.

3,911,556
CONTAINER FILM CUTTING ASSEMBLY

Joseph E. Pierce, Allentown, Pa., assignor to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 492,561, July 29, 1974. This application Mar. 14, 1975, Ser. No. 558,613
Int. Cl.² B26D 9/00
U.S. Cl. 29—558 **2 Claims**



1. A method of trimming a web of film which has been attached to the top of a container with a cutting assembly comprising:

positioning a container with a film attached to and extending beyond its top edges beneath a cutting assembly;

moving opposing semicircular-shaped clamps about the top peripheral portion of the container to hold said container and encircle said top portion beneath the film;

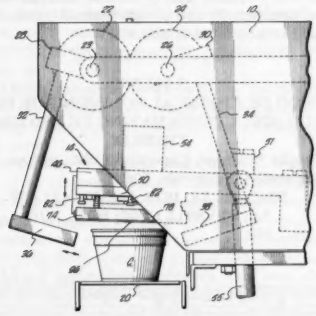
moving a spring-biased pressure ring over said film and pressing the film against the top of said clamps; and,

moving a rotating knife blade through said film to define a 360° cut about the top outer periphery of said container.

3,911,557
CONTAINER FILM CUTTING ASSEMBLY

Joseph E. Pierce, Allentown, Pa., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed July 29, 1974, Ser. No. 492,561
Int. Cl.² B23Q 41/00
U.S. Cl. 29—565 **8 Claims**



1. An assembly for cutting a film from about the top of a container comprising:

a frame;

a pair of opposing movable support clamps pivotally connected to said frame, said clamps adapted to pivot into a closed position to define an opening corresponding to the top periphery of the container;

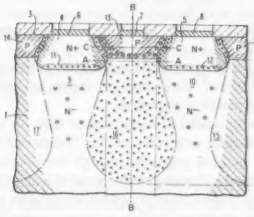
a cutting means pivotally mounted on said frame including an upper support plate and a lower pressure ring, said pressure ring being connected to said support plate by a spring biased fastening means; and,

a rotating bar with a knife blade secured to at least one end thereof, said bar being rotatably mounted in said support plate concentric with said pressure ring.

3,911,558
MICROAMPERE SPACE CHARGE LIMITED TRANSISTOR

Kanu Ashar, Wappingers Falls, and Steven Magdo, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 209,233, Dec. 17, 1971, Pat. No. 3,840,886. This application July 22, 1974, Ser. No. 490,531
Int. Cl.² B01J 17/00
U.S. Cl. 29—571 **3 Claims**



1. A method for simultaneously producing NPN and PNP space charge limited transistors comprising:

providing a high resistivity substrate of at least 10,000 ohm-centimeter semiconductor material and of one conductivity type,

forming first impurity zones of the other conductivity type extending from one surface of said substrate into the interior thereof,

forming second impurity zones of said one conductivity type extending from said one surface and reaching deeper into said substrate than said first impurity zones,

a first pair of said first impurity zones being formed so that they are separated from each other by one of said second impurity zones and a second pair of said second impurity zones being formed so that they are separated from each other by one of said first impurity zones,

providing contacts for biasing said first pair of zones and the second zone therebetween for transistor operation including forward biasing one of said first pair of zones relative to said second zone therebetween, and

providing contacts for biasing said second pair of zones and the first zone therebetween for complementary transistory operation including forward biasing one of said second pair of zones relative to said first zone therebetween.

3,911,559
METHOD OF DIELECTRIC ISOLATION TO PROVIDE BACKSIDE COLLECTOR CONTACT AND SCRIBING YIELD

Kenneth E. Bean, and Albert Neal Akridge, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,631
Int. Cl.² H01L 21/304, 21/306, 21/36
U.S. Cl. 29—578 **4 Claims**

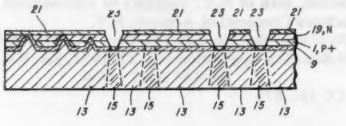
1. A method of forming a semiconductor structure useful in the fabrication of semiconductor devices which comprises the steps of:

a. selectively etching a monocrystalline semiconductor substrate to provide therein a plurality of thickness indi-

cator grooves extending into the surface of said semiconductor substrate to a precisely determined depth, at least two of said grooves having different depths;

b. forming a selectively apertured mask on said semiconductor surface, said apertures having discrete locations spaced from said grooves;

c. exposing the resulting masked semicondutor surface to epitaxial growth conditions whereby polycrystalline semicondutor deposits are formed on said oxide layer, concurrently with the formation of monocrystalline semiconductor material at said aperture locations whereby the resulting semiconductor deposit is characterized by a polycrystalline matrix having single crystal regions extending therethrough;



d. thinning the original semiconductor substrate from the backside thereof until one or more of said thickness indicator grooves is exposed;

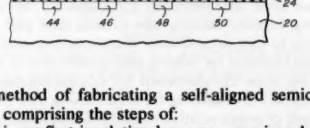
e. growing an epitaxial semiconductor film on the backside of the remaining original semiconductor substrate; and

f. selectively etching grooves through the original semiconductor substrate having said epitaxial layer thereon such that at least one etched groove is located in registry with one of the monocrystalline regions extending through said polycrystalline deposit.

3,911,560
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING SELF-ALIGNED IMPLANTED BARRIERS WITH NARROW GAPS BETWEEN ELECTRODES

Gilbert F. Amelio, Saratoga, and Harold H. Hosack, Cupertino, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 25, 1974, Ser. No. 445,361
Int. Cl.² B01J 17/00
U.S. Cl. 29—578 **11 Claims**



1. A method of fabricating a self-aligned semiconductor structure comprising the steps of:

a. forming a first insulating layer on a semiconductor substrate;

b. forming an electrically conducting layer on said first insulating layer;

c. forming a second insulating layer on said electrically conducting layer;

d. removing portions of said second insulating layer at regular intervals along said second insulating layer to demarcate the location of barrier regions to be formed in underlying registration in said substrate;

e. forming barrier regions in the surface portion of said substrate;

f. forming silicon dioxide islands within said removed portions;

g. removing those silicon dioxide islands and those portions of said electrically conducting layer above a first series of alternate barrier regions;

h. removing that portion of said second insulating layer and said electrically conducting layer which span the distance between the right-hand edge of each barrier region of said first series of alternate barrier regions and the left-hand edge of the adjacent barrier regions, the removal being accomplished with minimal undercutting of the left-hand edge of the portions of said electrically conducting layer which remain to thereby produce a plurality of gate electrodes in self-alignment with the underlying adjacent barrier regions;

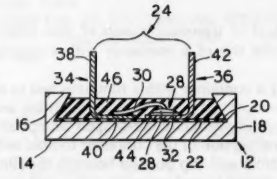
i. forming protective insulation over said plurality of gate electrodes; and

j. forming a second plurality of gate electrodes in interstitial arrangement with said plurality of gate electrodes.

3,911,561
METHOD OF FABRICATING AN ARRAY OF SEMICONDUCTOR ELEMENTS

Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.

Division of Ser. No. 284,272, Aug. 28, 1972, Pat. No. 3,820,153. This application Feb. 19, 1974, Ser. No. 443,236
Int. Cl.² B01J 17/00
U.S. Cl. 29—588 **5 Claims**

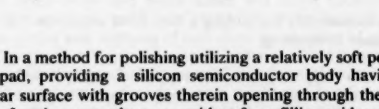


1. A method of fabricating an array of semiconductor elements comprising providing a metallic base having a high thermal conductivity, coating said base with a first curable layer of material having a low electrical conductivity and a high thermal conductivity, curing said first layer of material, adhesively affixing a plurality of semiconductor elements with a cement of said curable material on said first layer of material in juxtaposition to each other, with the terminals of said plurality of semiconductor elements extending upwardly from said metallic base, coating said plurality of semiconductor elements with a second layer of curable material having a low electrical conductivity and a high thermal conductivity, and curing said second layer of material.

3,911,562
METHOD OF CHEMICAL POLISHING OF PLANAR SILICON STRUCTURES HAVING FILLED GROOVES THEREIN

Albert Peeplis Youmans, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 14, 1974, Ser. No. 432,839
Int. Cl.² B01J 17/00; H01L 1/10
U.S. Cl. 29—590 **9 Claims**



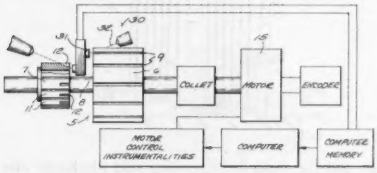
1. In a method for polishing utilizing a relatively soft polishing pad, providing a silicon semiconductor body having a planar surface with grooves therein opening through the surface, forming a stop layer on said surface, filling said grooves with a filling material, applying the polishing pad to the sur-

face of the body having the grooves therein and applying first and second active chemicals to said pad causing relative movement between the relatively soft polishing pad and the silicon wafer to provide a polishing action and continuing the polishing action to remove excess filling material until the stop layer is reached so as to provide a generally planar surface in which filling material still fills the grooves so that the last named generally planar surface is uninterrupted.

3,911,563
METHOD OF ATTACHING ARMATURE COIL LEADS TO COMMUTATOR BARS

Dale L. Anderson, Mound, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 348,853, April 6, 1973, abandoned. This application Mar. 25, 1974, Ser. No. 454,678
Int. Cl. H02k *15/04, 15/02*
U.S. Cl. 29—597 **25 Claims**



1. In the method of winding armatures and the like, wherein coils of wire are wound onto defined portions of a core assembly by means of an automatic winding machine, and wherein acceptability of the finished product requires the characteristics of the core assembly to satisfactorily meet, within limited tolerances, a predetermined norm, the improvement which comprises:

A. before any wire is wound onto the core assembly and by means of sensing instrumentalities operatively related to the core assembly, producing a record that reflects the actual characteristics of the core assembly;

B. by means of a computer type instrumentality comparing said record with a definition of the charcteristics of the core assembly already recorded in said computer type instrumentality, and which definition identifies said predetermined norm; and

C. utilizing the results of said comparison to produce a signal which

1. automatically initiates the winding operation in the event said comparison establishes that the actual characteristics of the core assembly satisfactorily meet said norm; or

2. withholds initiation of the winding operation in the event said comparison reveals that the actual characteristics of the core assembly do not satisfactorily meet said norm.

12. In the method of winding armatures which begins with placement of an unwound armature core assembly having a slotted core and a segmented commutator on a common shaft in an automatic armature winding machine by which coils of wire are successively wound into paired core slots and wire leads to and from the successively wound coils are attached to parts of selected commutator segments, said core slots and said parts of the commutator segments comprising two different series of circumferentially spaced wire receiving means, each of which travels in a circular orbit as the armature core assembly is rotated about its axis, and which machine requires the paired core slots into which wire is to be wound to be in predetermined angular positions before the winding operation begins, and also requires the wire receiving part of the commutator segments to which a lead is to be attached to be in a predetermined angular position before the attachment of the lead can be effected, the improvement by which said angular positions of said wire receiving means are accurately and quickly achieved, and which comprises:

A. rotating the unwound armature core assembly about its axis through a predetermined angle to thereby carry both series of wire receiving means around their respective orbits;

B. while the unwound armature core assembly is thus rotated and by means of sensing instrumentalities identifying the locations of the individual wire receiving means with respect to a point in the orbit of each of said series, and recording that information in a retrievable manner;

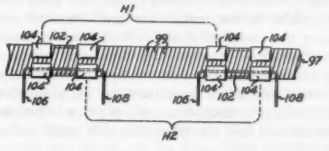
C. thereafter between the winding of the successively wound coils and by power means capable of effecting minute increments of rotation as well as fast rotation through substantial angles, effecting incremental rotation of the armature core assembly to successively bring the paired core slots into winding receiving position and also bring said wire receiving parts of the commutator segments into a lead receiving position; and

D. by means of a computer-type instrumentality into which said recorded information has been fed, so controlling said power means that the paired core slots are quickly and accurately brought into winding receiving position and the lead receiving parts of the commutator segments are likewise quickly and accurately brought to the lead receiving position.

3,911,564
METHOD OF MAKING HEATER ASSEMBLY

Leo Marcoux, Rehoboth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 347,118, April 2, 1973, Pat. No. 3,833,874, which is a division of Ser. No. 159,894, July 6, 1971, Pat. No. 3,760,352. This application Apr. 22, 1974, Ser. No. 462,681
Int. Cl.² H05B *3/00*
U.S. Cl. 29—611 **1 Claim**

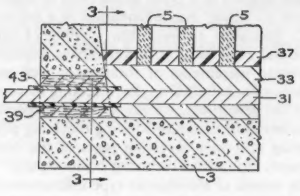


1. A method of making a heater assembly comprising the steps of providing an elongated substrate of electrical insulating material, winding an electrical resistance wire around the substrate helically along its length, disposing an electrical lead on the substrate on top of the electrical resistance wire so that the lead extends generally parallel to the length of the substrate, placing sheet like members over the substrate, electrical resistance wire and electrical lead at spaced intervals along the length of the substrate, the sheet like members having first and second ends first, second and third tab means extending from the sheet adjacent one another between said ends, bending the first and third tab means about the substrate to clampingly engage the substrate with the electrical lead in electrical connection with the electrical resistance wire, bending the second tab means away from the substrate to serve as heater mounting means and cutting the substrate, sheet like members and lead wire intermediate the ends of each sheet like member through one of said first and third tab means to produce a plurality of heater assemblies.

3,911,565
METHOD OF PROTECTING CURRENT LEADS IN ELECTROLYTIC CELLS

Allen J. Biedermann, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 24, 1974, Ser. No. 473,041
Int. Cl.² H01B 13/06; C25D 17/04
U.S. Cl. 29—624 5 Claims



1. In a method of preparing an anode unit for an electrolytic cell, which anode unit comprises:
   a. a cell bottom;
   b. a lead anode base in the cell bottom;
   c. an electroconductive metal bar imbedded in said lead anode base for conducting electrical current thereto and extending outwardly from the cell bottom and the lead anode base;
   d. an anode imbedded in and extending upwardly from said lead anode base;

wherein said anode unit is prepared by the method comprising:

a. placing said electroconductive metal bar and said anode into juxtaposition with each other within a cell mold;
b. providing molten lead in the cell mold in contact with said electroconductive metal bar and said anode whereby to fuse said electroconductive metal bar and anode; and
c. placing the lead anode base in the cell bottom whereby the anode extends upwardly therefrom and the electroconductive metal bar extends outwardly therefrom through an aperture in a side wall of the cell bottom;

the improvement comprising sealing the joint between the electroconductive metal bar and the lead anode base where the electroconductive metal bar extends through the aperture in the side wall of the cell bottom by applying a heat shrinkable sleeve prepared from a thermoplastic resin rendered thermosetting by irradiation around said electroconductive metal bar prior to pouring molten lead around said electroconductive metal bar.

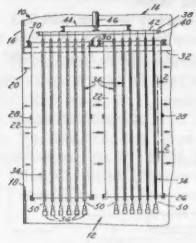
3,911,566
METHOD OF PACKAGING, SHIPPING AND INSTALLING DISCHARGE ELECTRODES FOR ELECTROSTATIC PRECIPITATORS

Robert H. Dusevoir, Box 2082, Dearborn, Mich. 48021

Division of Ser. No. 311,214, Dec. 1, 1972, Pat. No. 3,819,985.
This application Apr. 12, 1974, Ser. No. 460,381
Int. Cl.² B03C 3/40; B65H 54/04, 55/04
U.S. Cl. 29—624 10 Claims

1. A method of packaging a discharge electrode comprising, providing a discharge electrode ribbon having an outer tubular sheath of an electrically conductive metal which is rigid and self-supporting throughout an axial length exceeding the desired axial length of a discharge electrode fabricated therefrom and capable of being plastically deformed into a coil without fracturing or rupturing, an inner core extending generally axially through the outer sheath and an insulator of a dielectric material interposed between the outer sheath and the inner core, coiling said discharge electrode ribbon such that the outer sheath thereof is plastically deformed by a cold-working process with none of said outer tubular sheath, inner core, and insulator being fractured or ruptured, and packaging the coiled discharged electrode ribbon in a container.

10. A method of packaging, transporting and fabricating discharge electrodes comprising, providing at a point remote from a job site a discharge electrode ribbon having an outer tubular sheath of electrically conductive metal which is rigid and self-supporting throughout an axial length exceeding the desired axial length of a discharge electrode to be fabricated therefrom and is capable of being plastically deformed into a coil and subsequently straightened without fracturing or rupturing, the discharge electrode ribbon having an inner core extending generally axially through the outer sheath and an insulator of dielectric material interposed between the outer

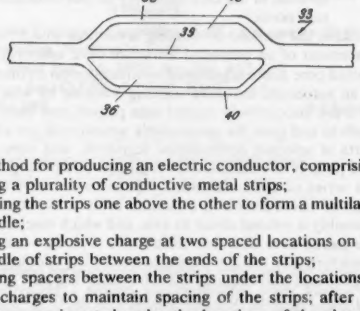


sheath and the inner core, coiling said discharge electrode ribbon such that the outer sheath thereof is plastically deformed by a cold-working process without said outer tubular sheath, inner core, and insulator being fractured or ruptured, packaging the coiled discharge electrode ribbon in a container, transporting the container with the coiled discharge electrode ribbon therein to the job site, at the job site removing at least a portion of the coiled discharge electrode ribbon from the container, at the job site straightening at least a portion of the coiled discharge ribbon to provide a straight axially extending discharge electrode ribbon portion, and at the job site severing the straightened axially extending discharge electrode ribbon portion to provide a plurality of discharge electrodes of predetermined lengths.

3,911,567
METHOD OF MANUFACTURING AN ELECTRIC CONDUCTOR OF METAL STRIPS

Peter Hofer, Hofen, Switzerland, assignor to Georg Fisher Aktiengesellschaft, Schaffhausen, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,112
Claims priority, application Sweden, Apr. 6, 1973, 735005; Mar. 4, 1974, 743001
Int. Cl.² H01R 43/00
U.S. Cl. 29—628 20 Claims



1. Method for producing an electric conductor, comprising:
providing a plurality of conductive metal strips;
disposing the strips one above the other to form a multilayer bundle;
placing an explosive charge at two spaced locations on the bundle of strips between the ends of the strips;
inserting spacers between the strips under the locations of the charges to maintain spacing of the strips; after the spacers are inserted under the locations of the charges, placing a spacing bridge at the ends of the strips to hold

them separated at the locations and them removing the previously inserted spacers that had been inserted between the strips under the locations;

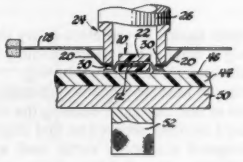
detonating the charges, exploding out the spacing bridge upon the detonation and explosion welding the strips in the bundle at the locations, thereby forming the strips into a solid plate where the detonated charges were located.

3,911,568

METHOD AND APPARATUS FOR BONDING MINIATURE SEMICONDUCTOR PILL-TYPE COMPONENTS TO A CIRCUIT BOARD

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 524,975
Int. Cl.² H05K *3/34*
U.S. Cl. 29—626 **4 Claims**



1. A method of transferring a miniature semiconductor pill-type component from a lead frame temporary carrier and directly soldering said component to a printed circuit board, said method comprising:

supporting a lead frame having a plurality of spaced semiconductor pill-type components temporarily attached thereto, each component having a plastic body encapsulating a semiconductor device chip and a plurality of leads for said chip radially extending from the body, said components being temporarily attached to said lead frame by at least two holding tabs extending from said lead frame into said plastic component body;

holding said lead frame parallel with and within about 0.25 inch above a printed circuit board, said circuit board having a plurality of mutually spaced, convergent, solder-coated conductors thereon corresponding to said component leads;

positioning a tubular, open ended soldering tool over one of said components, said tool having an end surface adapted for engaging said component leads and having slots in peripheral portions of said end surface corresponding to said holding tabs, said tool having a vertical bore throughout its entire length that is larger than said component body yet smaller than the periphery defined by outer portions of said component leads;

positioning visual enlargement means above said tool in mutual registration with said bore;

aligning said component leads with said circuit board conductors while viewing inner portions of said leads and conductors by looking through said bore in said tool;

heating said tool;

moving said tool toward said circuit board to sequentially engage said component leads with said tool end surface, bend said leads toward said circuit board conductors, tear said holding tabs from said component body by coaction with said tool slots after maintenance of lead-conductor alignment is assured, and finally, to form and clamp said leads against their corresponding circuit board conductors; and

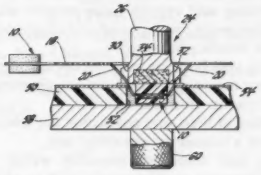
soldering said component leads to their corresponding circuit board conductors with the heated tool.

3,911,569

METHOD AND APPARATUS FOR BONDING MINIATURE SEMICONDUCTOR PILL-TYPE COMPONENTS TO A CIRCUIT BOARD

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 525,022
Int. Cl.² H05K *3/34*
U.S. Cl. 29—626 **4 Claims**



1. A method of simultaneously transferring miniature semiconductor pill-type components from a lead frame temporary carrier and soldering said components directly to a printed circuit board, said method comprising:

supporting a lead frame having a plurality of individual semiconductor miniature pill-type components temporarily attached thereto, said components having a plastic body encapsulating a semiconductor device chip and a plurality of discrete leads for said chip extending radially from said body in a generally common plane, said components being temporarily attached to said lead frame by at least two holding tabs extending from said lead frame into said plastic body;

holding said lead frame parallel with and within about 0.25 inch above a printed circuit board, said circuit board having an opening therein adapted for receiving said component body and a plurality of solder-coated conductors corresponding to said component leads converging on said opening in the circuit board;

aligning one of said components in said lead frame with a rod-like portion of a combination transfer and soldering device, said portion having an end adjacent said component with a periphery corresponding to and slightly smaller than the periphery of said component leads whereby said leads can be seen when viewing along the length of said rod from the opposite end, said end having slots therein corresponding to said component holding tabs in said lead frame;

registering said component leads with said corresponding conductors converging on said circuit board opening while viewing said leads and conductors from said opposite end of said combination transfer and soldering device;

moving said combination transfer and soldering device toward said circuit board to sequentially engage said end with said component body, press said body into said circuit board opening, pull said body away from said lead frame holding tabs after maintenance of component lead-conductor registration is assured, and finally clamp said leads against said circuit board conductors; and

heating at least said end of said combination transfer and soldering device to a temperature greater than the melting point of said solder on said circuit board conductors while concurrently isolating said component body from deleterious heat to solder all of said component leads simultaneously to said circuit board conductors without adverse effects on said semiconductor device chip in said body.

3,911,570

ELECTRICAL CONNECTOR AND METHOD OF MAKING

Baynard R. Smith, North Palm Beach, Fla., assignor to Electro Oxide Corporation, Palm Beach Gardens, Fla.

Filed Aug. 21, 1973, Ser. No. 390,311
Int. Cl.[2] H01R 9/00
U.S. Cl. 29—630 D 13 Claims

1. A method of bonding connector pins within a ceramic substrate member to form an electrical connector including the steps of:

a. establishing a weight ratio of between 0.5–10.0 parts of copper oxide powder to 1.0 parts of one material from the group consisting of silver and silver oxide powder;

b. combining said copper oxide powder and said material from the group consisting of said silver and silver oxide to form a bonding mixture;

c. placing said bonding mixture on said ceramic substrate member contiguous to at least one opening formed within said ceramic substrate member;

d. inserting at least one connector pin within said opening to form a connector assembly; and,

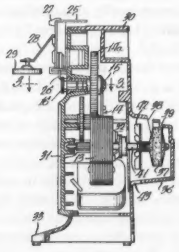
e. firing said connector assembly within a temperature range between approximately 950° to 1010°C. to form a bond between said connector pin and said ceramic substrate.

3,911,571

CAN OPENER

George Mark Ponczek, Chicago, and Charles F. Seitz, Oak Park, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Aug. 23, 1974, Ser. No. 499,842
Int. Cl.[2] B67B 7/38
U.S. Cl. 30—4 R 5 Claims



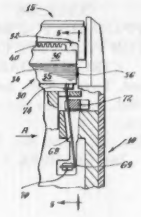
1. In a motor driven can opener of the type having a housing enclosing an electric motor which is drivingly connected to a can rotating means, and cutting means movably mounted on said housing for engagement with the top of a can being opened, the combination comprising a removable serrated feed wheel a front side and a back side; a feed-wheel-shaft extending from the back side of said feed wheel; an elongated gear-driven-shaft having two ends; one of said ends being positioned within said housing and being driven by said electric motor; the other of said ends extending to the exterior of said housing and being formed with an elongated chamber adapted to drivingly receive said feed-wheel-shaft whereby rotation of said gear-driven-shaft rotates said feed-wheel-shaft and said feed wheel; and spring means located between said feed-wheel-shaft and said chamber and exerting pressure therebetween to retain said feed-wheel-shaft against axial displacement with respect to said gear-driven shaft, said feed wheel and feed-wheel-shaft being detachable from said gear-driven-shaft providing disassembly of said feed wheel and feed-wheel-shaft from said can opener independently of said cutting means.

3,911,572

TRIMMER DEVICE FOR AN ELECTRIC DRY SHAVER

Peter A. Czerner, Trumbull; John F. Daniels, Bridgeport; Richard Ihasz, Milford, and Edward Szymansky, Fairfield, all of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 14, 1974, Ser. No. 479,315
Int. Cl.[2] B26B 19/10
U.S. Cl. 30—34.1 4 Claims



1. A trimmer device for an electric dry shaver including a casing having a main cutter head assembly and drive means therefor, said trimmer device comprising,

a. an elongated housing element disposed within a cavity in one face of said casing for housing the trimmer assembly,

b. a guard member secured to said element,

c. an elongated stationary cutter and a movable cutter mounted thereon carried by and interposed between said guard and housing element to provide said trimmer assembly,

d. hinge means on said housing element and said casing providing for pivotal movement of the trimmer assembly into and out of said cavity to place said cutters in non-operative and operative positions,

e. spring means carried by said housing element for normally biasing said element outwardly of said cavity to the operative position,

f. latch means on said shaver casing for maintaining said element in the non-operative position,

g. said latch means include an elongated spring member having two ends, and a latch projection on said guard member, one end of said spring member engaging the latch projection and the opposite end secured to said casing, said spring member being normally biased into engagement with said latch projection, and

h. spaced from said trimmer assembly a release means mounted on said casing and in engagement with said spring member between said spring member ends to release said trimmer assembly to the operative position.

3,911,573

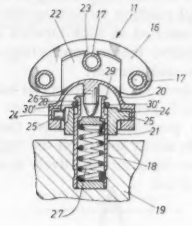
DRY SHAVER

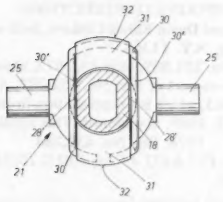
Klaus Limberg, Solingen, Germany, assignor to Robert Krups, Solingen-Wald, Germany

Filed Sept. 25, 1973, Ser. No. 400,519
Claims priority, application Germany, Sept. 30, 1972, 2248103
Int. Cl.[2] B26B 19/02
U.S. Cl. 30—43.92 4 Claims

1. In a dry shaver, a combination comprising a casing; a shearhead including a set of cutter blades and a carrier therefor; an oscillatable drive projection extending from said casing and having a free end and an outer circumferential surface provided at diametrally opposite sides with two recesses, each of said recesses having a planar surface portion which is substantially parallel to the other planar surface portion, said planar surface portions being spaced from said free end of said drive projection and inwardly recessed from the rest of said circumferential surface; a sleeve mounted on said carrier and having an axial end and a wall portion extending axially from

said axial end and having a radially projecting portion, said sleeve being provided with a central passage partially bounded by said wall portion and adapted to accommodate said drive projection; and an annular spring element mounted on said sleeve and having a section which is located under said radially projecting portion, and a pair of additional sections which





extend into said central passage of said sleeve adjacent said axial end thereof and which resiliently yieldably abut against said two planar surface portions when said drive projection is accommodated in said passage so as to connect said sleeve to said drive projection but which are adapted to disengage said planar surface portions and to snap out of said recesses when a predetermined axial pull is exerted on said sleeve.

3,911,574

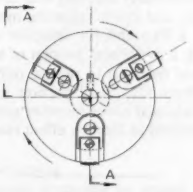
INTERNAL PIPE CUTTING APPARATUS

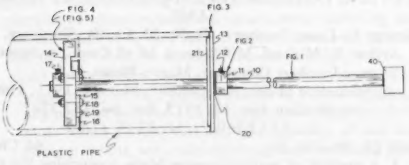
Donnie R. Jones, 35 Oak View Drive, San Rafael, Calif. 94903

Continuation of Ser. No. 300,206, Oct. 24, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,849

Int. Cl.² B23D *21/10, 21/14;* **B26D** *3/16*

U.S. Cl. 30—105 **10 Claims**





1. Apparatus comprising a shaft, centering means slideably and rotably mounted on the shaft for centering the shaft inside a pipe, means for controlling the distance of entry of the shaft inside the pipe, a sawhead perpendicularly attached to the shaft, radially aligned track means disposed in said sawhead, cutting surfaces slideably attached to said track means, means for slideably attaching the cutting surfaces to said track means and automatic power means for rapidly rotating said shaft, whereby the cutting surfaces upon rotation of the shaft and saw head are thrown by centrifugal force radially outward along the track means and away from the shaft onto the inner surface of the pipe for cutting engagement therewith.

3,911,575

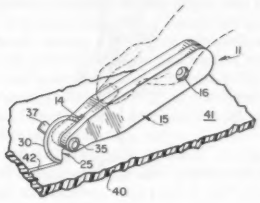
CUTTING TOOL

Mario Anesi, Inverness, Ill., assignor to Ansan Tool and Manufacturing Co., Inc., Chicago, Ill.

Filed May 13, 1974, Ser. No. 469,054

Int. Cl.² B26B *1/04*

U.S. Cl. 30—164.9 **2 Claims**



1. An adjustable tool for cutting sheet material comprising an elongated handle, a substantially circular blade attached to said handle and extending therefrom, said blade having a recess formed in the perimeter thereof, said recess being substantially V-shaped, said blade having two radially outwardly converging surfaces intersecting to form an arcuate cutting edge extending circumferentially thereof between the outer ends of said recess, said recess including a flat planar surface intersecting said converging surfaces respectively to form two straight cutting edges which intersect at said arcuate cutting edge to form a cutting point, said flat planar surface forming one leg of the "V" of said recess, said flat planar surface being disposed in use at a first angle with respect to the surface of the associated sheet material and at a second angle with respect to the longitudinal axis of said handle, said blade being movable with respect to said handle for varying said second angle, whereby in use the inclination of said handle with respect to the surface of the associated sheet material may be adjusted without varying said first angle.

3,911,576

NUT SPLITTING TOOL

John H. Castoe, 10234 McVine, Sunland, Calif. 91040

Filed Oct. 25, 1974, Ser. No. 517,815

Int. Cl.² B26B *17/02*

U.S. Cl. 30—189 **10 Claims**

1. A nut splitting tool comprising:

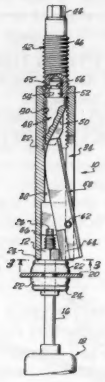
a generally narrow, elongated tubular body having a bore extending through it between a first opening at one end and a second opening at the other end thereof;

a leverage adjusting member rotatably mounted in the first opening of the tubular body and having a portion thereof extending into the bore of the tubular body and having an exterior portion extending therefrom for engagement with a tool for rotating the adjustment member relative to the tubular body;

a slide member disposed in the bore of the tubular body and attached to the portion of the leverage adjusting member disposed therein, the slide member having a rearwardly inclining wedge-like slide surface movable lengthwise in

the bore toward the second opening in the tubular body; and

an elongated leverage arm carried on the tubular body and mounted to pivot in the bore of the body, the leverage arm having a first end portion forwardly inclining and slidably engaged with the wedge-like slide surface of the slide member, and a second end formed as a blade member and movable in the second opening in the tubular body;

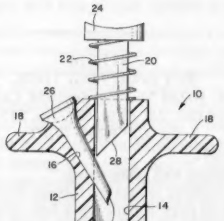


the slide member being attached to the leverage adjusting member and engaged with the leverage arm so that rotation of the adjusting member translates the slide member lengthwide in the bore, while preventing rotation of the slide member relative to the bore, to progressively force the slide surface of the slide member toward the second opening and thereby into a wedging, non-rotating engagement with the first end portion of the leverage arm to pivot the leverage arm and force the blade member thereof into contact with a nut disposed in the second opening of the tubular body.

3,911,577
GOLF TEE SHARPENER

Robert J. Nickel, 240-54 37 Ave., Douglaston, N.Y. 11363

Filed May 30, 1974, Ser. No. 474,716
Int. Cl.² B91D *27/00*
U.S. Cl. 30—241 **1 Claim**



1. A handy golf tee sharpening device for shearing off the ragged end portion of a used golf tee stem, to thereby renew the latter for further use, said device consisting of

a solid body having a longitudinal way of rectangular cross-section extending from the top to the bottom thereof, a pair of finger grips extending laterally from opposite sides of said body and an inclined tapered socket extending downwardly and diagonally from one of said finger pieces, through the latter and terminating in an opening in the adjacent flat wall of such way;

a solid plunger of rectangular cross section mounted to slide in such way, having a thumb-piece comprising a push-button at the top thereof, and a sharp-end comprising a blade at the other end facing such socket opening; and

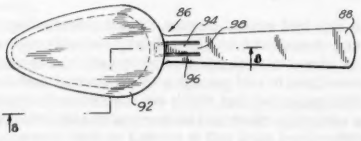
a spring located around said plunger between said push-button and the top of said body acting to urge the plunger toward an initial position permitting the stem of a used golf tee to be inserted in such tapered socket with the ragged end portion thereof projecting diagonally into such way below said plunger;

so that when the device is grasped in one hand between the thumb and fore fingers and the plunger is advanced by depressing the push-button against the force of said spring, the blade neatly shears off the ragged end portion of the stem, providing an effectively new tee for subsequent additional use.

3,911,578
SPOON CONSTRUCTIONS

Meyer Ushkow, and David Elliott Ushkow, both of 75-04 196th Place, Flushing, N.Y. 11366

Division of Ser. No. 251,989, May 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 852,287, Aug. 22, 1969, Pat. No. 3,662,463, which is a continuation-in-part of Ser. No. 793,522, Jan. 23, 1969, abandoned. This application Feb. 5, 1974, Ser. No. 439,784
Int. Cl.² A47J *43/28;* **G01G** *19/56*
U.S. Cl. 30—326 **11 Claims**



1. A spoon construction comprising a spoon member having a bowl portion dimensioned to receive an accurately measured amount of liquid or powder and formed with an upstanding peripheral rim and a handle portion projecting from said bowl portion for manipulation of said spoon member; a cover member dimensioned to encompass said bowl portion rim for retaining said liquid or powder within said bowl portion; means for removably securing said cover member to said bowl portion rim; and cover releasing means on said spoon member having a free end for selective displacement to a position at which a peripheral portion of said cover member is engaged by said free end to release only a portion of said cover member from said bowl portion rim to define a tab formed by said released cover member portion which can be manually manipulated to thereby effect removal of said cover member.

3,911,579
CUTTING INSTRUMENTS AND METHODS OF MAKING SAME

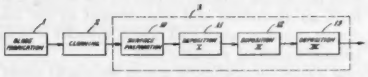
George C. Lane, Danbury; Phyllis M. Curtis, Simsbury, and Arthur E. Michael, Middletown, all of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 144,509, May 18, 1971. This application Apr. 18, 1973, Ser. No. 352,374
Int. Cl.² B26B *21/54;* **B21K** *11/00*
U.S. Cl. 30—346.54 **66 Claims**

1. A method of making a razor blade comprising the steps of:

forming a blade from a suitable material, the blade having an elongate edge comprising two intersecting surfaces;

sputter depositing on the edge a first coating of refractory material;



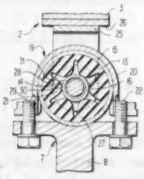
coating the edge with a second material displaying adhesion to a subsequent coating of lubricious material and to the refractory material; and then coating the edge with the lubricious material.

3,911,580

COAXIAL VIBRATING ISOLATION UNIT FOR A CHAIN SAW INCLUDING DISCRETE, INDEPENDENTLY OPERABLE ELEMENTS

Jay Richard Bailey, Chatsworth, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed July 3, 1974, Ser. No. 485,424
Int. Cl.[2] B23D *57/02*
U.S. Cl. 30—381 **6 Claims**



1. In a chain saw having

a vibrating assembly including an engine having a crankshaft, and cutter chain means traversing a cutting path;

support means including handle means; and

a plurality of vibration isolation means interconnecting said vibrating assembly and said support means, with at least one of said vibration isolation means including

resilient diaphragm means having an aperture, extending transversely of said cutting path, and extending generally parallel with the axis of rotation of said crankshaft; shaft means passing through said aperture of said diaphragm means, with said diaphragm means being journaled upon said shaft means;

first, resilient, impedance means, mounted on said shaft means, and abuttingly and separably engaging one side of said diaphragm means;

second, resilient, impedance means, mounted on said shaft means, and abuttingly and separably engaging an opposite side of said diaphragm means;

first mounting means connecting said diaphragm means with one of said vibrating assembly and said support means; and

second mounting means connecting said shaft means with the other of said vibrating assembly and said support means;

the improvement residing in said diaphragm means and comprising:

a plurality of independently operable, resilient beam means spaced circumferentially about said shaft means,

each of said resilient beam means being spaced circumferentially from others of said resilient beam means, and

each of said resilient beam means being operable to flex longitudinally and transversely of said shaft means independently of others of said beam means;

a plurality of independently operable, resilient compression pad means spaced circumferentially about said shaft means,

each of said compression pad means being carried by a said beam means and spaced circumferentially from others of said compression pad means, and

each of said compression pad means being operable to compressibly absorb energy in localized cooperation with said shaft means independent of others of said compression pad means; and

a plurality of independently operable, energy dissipating and motion dampening means spaced circumferentially about said shaft means, with each of said energy dissipating means being disposed in energy dissipating, frictional cooperation with at least one of said impedance means, each of said energy dissipating and motion dampening means being carried by a said beam means and spaced circumferentially from others of said energy dissipating and motion dampening means, and

each of said energy dissipating and motion dampening means being operable to effect energy dissipating and motion dampening, frictional cooperation with a said impedance means and said shaft means in response to movement of said energy dissipating means relative to said impedance means and said shaft means;

generally annular resilient rim means encircling and supporting said spaced resilient beam means, with said resilient beam means depending inwardly thereof;

each said compression pad means comprising a convex extremity of a said resilient beam means, disposed in relatively moveable, frictionally interacting engagement with said shaft means; and

each said resilient beam means extending generally radially of said shaft means, with said plurality of generally radially extending resilient beam means providing a plurality of circumferentially spaced, radially extending, flexing means extending generally radially between said first and second impedance means and said generally annular, resilient rim means.

3,911,581

TOOTH FILLING AND FACING COMPOSITION COMPRISING A RADIOPAQUE GLASS AND METHOD OF USING THE SAME

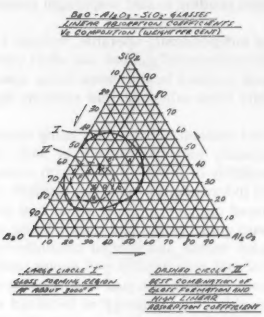
Earl D. Dietz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 12,109, Feb. 17, 1970, abandoned. This application Apr. 25, 1972, Ser. No. 247,293
Int. Cl.[2] A61K *5/08;* **C08K** *3/34;* **C09K** *3/00*
U.S. Cl. 32—15 **16 Claims**

1. The new use for a barium aluminosilicate glass having a BaO content greater than 22.5 percent by weight, said new use comprising the steps of:

a. forming a filling or facing material by combining said barium aluminosilicate glass and a finely divided inor-

ganic material to form a filler composition, and an organic polymer as a binder therefor; said filling or facing material containing about 20–80 parts by weight of said filler composition and 80–20 parts by weight of said organic polymer binder, said parts by weight being based on the total weight of said filling or facing material; and said filler composition containing 50–90 parts by weight of said finely divided inorganic material and 10–50 parts



by weight of said barium aluminosilicate glass, said parts by weight being based on the total weight of said filler composition; and

b. filling or facing a natural tooth with said filler material;

c. whereby the resultant filling is radiopaque to X-rays used by dentists, has a desirable color like that of natural teeth, an index of refraction like that of natural teeth, high strength and wear resistance and a thermal expansion like that of natural teeth and is non-toxic.

3,911,582
DOSING APPARATUS FOR MIXING THE CONSTITUENTS OF TOOTH FILLINGS

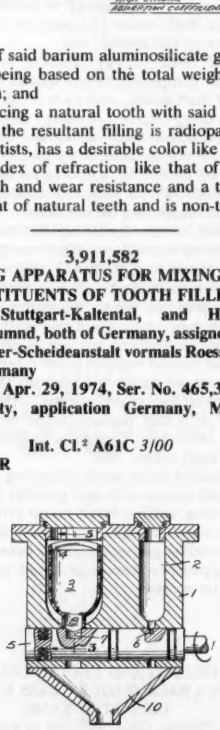
Fritz Rühm, Stuttgart-Kaltental, and Heinz Strähle, Schwabisch Gumnd, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Apr. 29, 1974, Ser. No. 465,362

Claims priority, application Germany, May 5, 1973, 2322681

Int. Cl.² A61C *3/00*

U.S. Cl. 32—40 R **2 Claims**



1. Dosing apparatus for the mixture constituents of dental fillings comprising

a housing structure having means defining supply containers for mercury and for amalgam filings,

a dosing cylinder rotatably mounted in said housing structure for movement between constituent receiving and constituent discharging positions,

said dosing cylinder having dosing chambers formed therein in positions to communicate with said supply containers when said dosing cylinder is in said constituent receiving position,

a funnel-shaped insert made of material having low friction disposed within the supply container for the amalgam filings,

said insert having an outlet spout of a shape complementary with the dosing cylinder seated on the dosing cylinder to form an all-around seal with respect to the associated dosing chamber when said dosing cylinder is in said constituent receiving position, and

spring means for resiliently urging the outlet spout of said insert into said seated relation with said dosing cylinder.

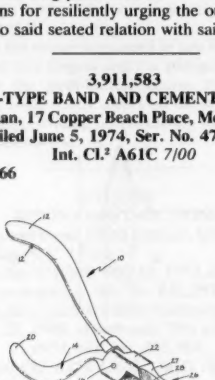
3,911,583
PLIERS-TYPE BAND AND CEMENT REMOVER

Robert Hoffman, 17 Copper Beach Place, Merrick, N.Y. 11566

Filed June 5, 1974, Ser. No. 476,519

Int. Cl.² A61C *7/00*

U.S. Cl. 32—66 **1 Claim**



1. Pliers comprising two opposed members, one of said members having a short movable jaw, the other of said members including a second shorter movable jaw, means pivotally mounting said members for movement of said jaws toward and away from each other, each of the said jaws having complementary abutting beaks provided with flat surfaces for abutment with each other, said first jaw projecting beyond said second jaw on both sides and at the forward end thereof, said sides being tapered inwardly and upwardly, said second jaw having its sides curved concavely inwards with varying radii of curvature and meeting the front edge of said second jaw, said front edge sloping downwardly and forwardly and being concavely shaped said concave edges meeting at two forward points.

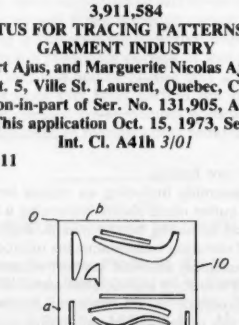
3,911,584
APPARATUS FOR TRACING PATTERNS FOR THE GARMENT INDUSTRY

Camille Albert Ajus, and Marguerite Nicolas Ajus, both of 910 Lamer, Apt. 5, Ville St. Laurent, Quebec, Canada

Continuation-in-part of Ser. No. 131,905, April 7, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,444

Int. Cl. A41h *3/01*

U.S. Cl. 33—11 **11 Claims**



1. A garment drafting apparatus suitable for drafting a garment, said garment drafting apparatus comprising a gener-

ally flat stencil board having a pair of opposed flat planar major surfaces, said flat stencil board having a plurality of stencilling apertures including a dart forming aperture therein extending between said opposed major surfaces, whereby each of said surfaces forms an aperture mirror image of the other,

said stencilling apertures having along at least one side a measurement indicating means,

said measurement indicating means being adapted to allow the drafting of a garment correlated to individual sizes,

said garment drafting apparatus including at least first and second generally S-shaped edges for drafting the front and back portion of a sleeve curve respectively,

each of said generally S-shaped edges comprising first and second generally straight line portions, and first and second arcs of first and s econd circle curves, said first generally straight line having measurement indicating means thereon,

said first generally straight line being joined to said first arc of said first circle curve,

said first arc of said first circle curve being joined to said second straight line,

said second straight line being of a substantial length and joined to said second arc of said second circle curve,

said second straight line being a tangent to said first and second arcs of said circle curves,

said second arc of said second circle curve having a radial center on the side of said second straight line opposed to the side having the radial center of said first circle curve, each of said pair of S-shaped edges comprised of said first and second arcs and first and second straight lines having one of the arcs of a larger radius than the other arc,

said pair of generally S-shaped edges cooperating such that the larger arc of said first S-shaped edge for drafting the front portion of a sleeve curve is opposed to the smaller arc of said second S-shaped edge for drafting the back portion of the sleeve curve, the smaller arc of the first S-shaped edge being opposed to the larger arc of the second S-shaped edge, and the second straight line portions are substantially adjacent and substantially parallel through their length.

3,911,585

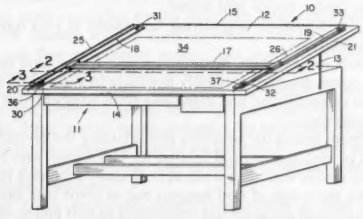
DRAWING BOARD GUIDES FOR PARALLEL RULING STRAIGHTEDGE

William J. McNeil, 719 Kahl Bldg., Davenport, Iowa 52800

Filed Jan. 4, 1974, Ser. No. 430,684

Int. Cl.² B43L *5/00*

U.S. Cl. 33—80 **5 Claims**



1. On a drawing board having a parallel rule with left and right ends and guided at the ends on cables extending in directions substantially perpendicular to the rule, said cables extending from the lower to the upper edges of the board, the improvement comprising: a first strip of a thin plastic layer of material fixed only at its upper and lower ends to the board adjacent an edge of the board and underlying an end of the parallel rule and the respective cable at the end; a second strip of thin plastic material fixed only at its upper and lower ends to the board adjacent its opposite edge and underlying the opposite end of the parallel rule and the respective cable at that end, at least one of said strips having a vertical flange for engaging the respective end of the rule so as to limit the horizontal movement of the rule in one direction.

3,911,586

PRECISION CONTROL APPARATUS

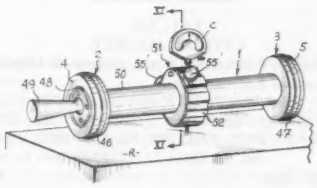
Alphonse Malonda, Bretigny-sur-Orge, France, assignor to Bretigny Rectification, Bretigny-sur-Orge, France

Filed June 27, 1973, Ser. No. 374,241

Claims priority, application France, June 29, 1972, 72.23567; May 15, 1973, 73.17481

Int. Cl.² G01B *5/28, 5/20*

U.S. Cl. 33—174 M **9 Claims**



1. An apparatus for checking machined parts, comprising: a rigid elongated body consisting of a bar and two end-plugs and being constructively made in one single piece; said bar having an external surface; said end-plugs being substantially identical with outer faces parallel to one another; said end-plugs having transverse cross-sections greater than the transverse cross-section of said bar; said identical end-plugs including, on each edge thereof, a supporting zone perpendicular to said outer faces and parallel to the longitudinal axis of said elongated body; a ring; measuring instrument means carried by said ring for measuring deviations from the plane defined by said supporting zones and including a probe with one extremity interposed between said supporting zones; said ring consisting of at least two detachably connected parts and having an internal surface of the same shape as said external surface of said bar for allowing the displacement of said ring axially along said bar; the internal dimensions of said ring being greater than the dimensions of the transverse section of said bar; said ring being provided with shoes having a low coefficient of friction, said shoes being interposed between said ring and said external surface of said bar.

3,911,587

JAG SYSTEM FOR MARKING DENTAL INSTRUMENTS FOR DEPTH PENETRATION

John Orchover Forrest, 6, Harcourt House Cavendish W. 1, and Adrian Harold Redfern Rowe, 137, Sydenham Hill S.E. 23, both of London, England

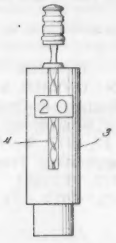
Filed Dec. 28, 1973, Ser. No. 429,119

Int. Cl.² G01B *5/02*

U.S. Cl. 33—174 R **2 Claims**

1. The method of marking root canal dental instruments for depth penetration into a particular root canel which comprises the steps of first determining the length of the root canal, then selecting the one of a set of blind bore jigs which has a bore equal in depth to the length of the root canal, placing a frictionally engaging annular marker on the instrument to be marked near the tip thereof, forcing the instrument into the

bore of the jig while the marker is stopped by the end of the jig until the tip of the instrument engages the bottom of the

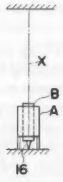


bore, and thereafter withdrawing the instrument with the adjusted marker thereon from the bore of the jig.

3,911,588
OPTICAL MARKER

Shoichi Ohneda, Wakayama, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed May 7, 1973, Ser. No. 357,700
Claims priority, application Japan, May 27, 1972, 47-52637; May 27, 1972, 47-62270; May 31, 1972, 47-64693
Int. Cl. G01c *15/02, 15/10*
U.S. Cl. 33—286 **4 Claims**



1. An optical marker for use in determining the position of a target point which is in alignment with a given or required point, which comprises:

a support structure;

a projector assembly including a cylindrical body accommodating therein a light source and a projecting lens unit and a probe downwardly extending from said cylindrical body and having a through hole in alignment with the longitudinal axis of said cylindrical body, said light source being disposed between said projecting lens unit and said through hole, and said light source and the optical axis of said projecting lens unit also being in alignment with the longitudinal axis of said cylindrical body, said light source, when switched on, emitting a pair of first and second beams of light respectively passing through said projecting lens unit and said through hole, said first and second light beams emerging from said projector assembly in a linearly aligned relation with respect to each other in opposite directions;

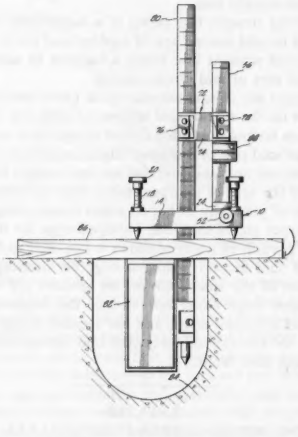
a gimbaled mechanism interposed between said projector assembly and said support structure for mounting said projector assembly on said support structure, said projector assembly thereby permitted to move with 2° of freedom; and

a clamping structure carried by said support structure and adapted to clamp said projector assembly, said clamping structure including a pair of shutter members carried thereby for sliding movement towards and away from one another and forming a central opening therebetween through which said probe loosely downwardly extends and a manually operable member operable between first and second positions, said manually operable member being operatively connected to means for moving said shutter members away from one another to release said probe when said manual operable member moves to said first position and for moving said shutter members toward one another to clamp said probe when said manual operable member moves to said second position.

3,911,589
ADJUSTABLE SUPPORT BASE FOR A FIELD MEASUREMENT DEVICE

Rudolph Myeress, Richmond Heights, Ohio, assignor to Allied Steel & Tractor Products, Incorporated, Cleveland, Ohio

Filed Dec. 19, 1973, Ser. No. 426,206
Int. Cl.² G01C *15/08;* **F16M** *11/00*
U.S. Cl. 33—286 **1 Claim**



1. An adjustable support base for a field measurement device comprising

a frame, said frame extending laterally to four support positions and including a vertical opening through the center thereof to allow placement and removal of a field measurement device below said frame;

means for adjustably supporting said frame at said four support positions;

a support rod pivotally mounted on said frame, said support rod being disposed generally normally to the lateral extensions of said frame and extending from adjacent said vertical opening;

adjustment means for adjusting and retaining the pivotal location of said support rod relative to said frame, said adjustment means including a pin eccentrically mounted relative to the pivot axis of said support rod to pivot with said support rod and a control rod attached at its first end to said pin and operably associated with said frame at its second end in order that said control rod may be moved to effect pivotal movement of said support rod;

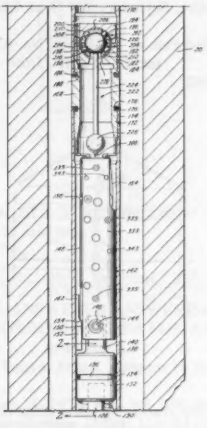
an offset assembly for clamping to said support rod at any point along the length of said support rod and providing a clamp for attachment of a standard surveying rod parallel to said support rod such that the standard surveying rod may extend through said vertical opening to support the field measurement device; and

means for establishing a vertical reference position in said support rod.

3,911,590
RECORDING INCLINOMETER-1

Mason R. Litchfield, and Floyd L. Scott, Jr., both of Houston, Tex., assignors to Thermotics, Inc., Houston, Tex.

Continuation of Ser. No. 123,961, March 15, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,701
Int. Cl. G01c *9/14*
U.S. Cl. 33—306 **12 Claims**



1. A well tool comprising:

a flow tube for connection in a drill string to transmit drilling fluid,

an instrument mounted in said flow tube, said instrument including indicator means responsive to a well characteristic for producing an indication measuring said characteristic,

recording means to record the indications of said indicator means,

flow responsive means responsive to a rate of fluid flow through said flow tube to actuate said recording means, said indicator means including an indicator movable in response to said well characteristic,

said recording means including marking means carried by said indicator and a mark receiving means actuated by said flow responsive means to actuate said recording means to record the well characteristic,

said mark receiving means including a cartridge reciprocable relative to said marking means and reciprocated by said flow responsive means, said mark receiving means being carried by said cartridge,

said recording means including drive means to move said mark receiving means relative to said cartridge,

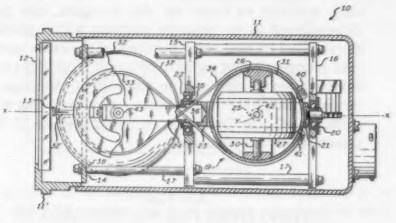
said drive means being actuated by said flow responsive means to move said drive means step by step in response to variations of the rate of flow exceeding a predetermined amount,

said mark receiving means comprising a tape having sprocket apertures therealong, said drive means comprising a rotatably mounted supply reel, a rotatably mounted take-up reel, and a rotatably mounted measuring sprocket reel, spring means tending to rotate said take-up reel in one direction, friction brake means resisting rotation of said supply reel, and escapement means limiting rotation of said measuring reel, said tape extending from said supply reel over said measuring reel to said take-up reel, said flow responsive means controlling said escapement means to effect movement of said drive means step by step as aforesaid.

3,911,591
BELT DRIVEN GYROSCOPIC INSTRUMENT FOR AN AIRCRAFT

James R. Dohogne, and Glen W. Driskill, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,599
Int. Cl. G01c *19/44*
U.S. Cl. 33—330 **5 Claims**



1. A gyroscopic attitude indicator instrument for aircraft comprising

a housing having a plurality of support walls, one of said walls including a viewing opening therein and a reference index within said opening representative of a reference axis of said aircraft,

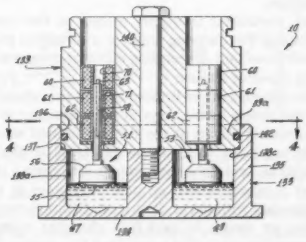
gyroscopic means mounted between two of said support walls for detecting the attitude of said aircraft axis relative to a fixed direction in space,

attitude indicator means mounted in a bifurcate structure having a trunnion rotatively positioned within a bearing disposed in one of said walls of said housing, said indicator means being viewable through said opening and cooperative with said reference index for indicating the attitude of said craft axis relative to said fixed direction, and flexible belt drive means coupled between said gyroscopic means and said indicator means in crossed fashion wherein the crossing point of said belt drive means is located within said trunnion thereby providing reversed pitch sensing by rotating said indicator means in an opposite direction relative to said reference indices.

3,911,592
TILT DETECTOR AND SYSTEM

Geoffrey J. Crask, Santa Ana, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Feb. 25, 1974, Ser. No. 445,639
Int. Cl.[2] G01C *9/22, 9/06*
U.S. Cl. 33—378 **8 Claims**



1. A tilt detector, comprising,

a. a container,

b. liquid in the container having an upper surface tending to remain generally horizontal as the container tilts,

c. sensors having independently movable members engaging the liquid at spaced locations to sense the relative levels of the liquid surface at said locations and with respect to the container during said tilting,

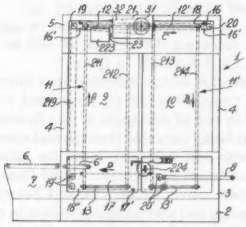
d. there being wells and ports formed in the container, the ports interconnecting the wells, the liquid in the container defining pools in said wells and having restricted intercommunication via said ports, said members comprising floats engaging the liquid pools at the surface thereof,

e. said sensors also including plungers connected to the floats, there being differential transformer coils magnetically coupled to cores on the plungers, said plungers dimensioned to be movable endwise within guide bores surrounded by said coils, portions of the cross sections of said plungers being radially different from the cross sections of said guide bores to form liquid drainage spaces between the plungers and bores communicating with said wells, said bores formed in an upper portion of the container relative to said wells.

3,911,593
DRYING OVEN FOR PRINTED SHEETS

Fabio Colapinto, c/o The Argon Service Ltd., via Malpighi 4, Milan, Italy

Filed July 11, 1974, Ser. No. 487,744
Int. Cl.² F26B *11/18*
U.S. Cl. 34—55 **10 Claims**



1. A drying oven for printed sheets, comprising:

a housing including an upright frame provided with a vertical partition dividing the interior thereof into a first and a second chamber;

ascending elevator means in said first chamber and descending elevator means in said second chamber each provided with support for trays having spaced-apart sheet-carrying bars;

upper horizontal transport means at the top of said frame for carrying trays in a direction parallel to said bars from said ascending elevator means to said descending elevator means;

lower horizontal transport means at the bottom of said housing for carrying trays in a direction parallel to said bars from said descending elevator means to said ascending elevator means;

loading means at the bottom of said first chamber for delivering sheets to the trays at the beginning of their ascent;

unloading means at the bottom of said second chamber for removing sheets from the trays at the end of their descent, said unloading means including a stripper member rotatable about an axis transverse to said bars and provided with dependent teeth fitting between said bars;

first jet means in said first chamber trained upon the ascending trays and connected to a source of hot air;

second jet means in said second chamber trained upon the descending trays and connected to a source of cold air;

common drive means for said ascending and descending elevator means and for said upper and lower transport means;

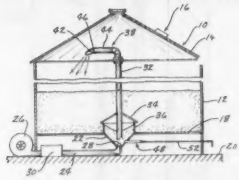
detent means yieldably engaging said stripper member for normally holding said teeth in their dependent position; and

alarm means responsive to a deflection of said teeth from their dependent position by an extraneous object lodged between said bars for deactivating said drive means.

3,911,594
PARTICULATE MATERIAL CIRCULATING MEANS

Daryl C. McIntire, Seymour, and Oran Clark, Corydon, both of Iowa

Filed Feb. 4, 1974, Ser. No. 439,552
Int. Cl.² F26B *25/00*
U.S. Cl. 34—102 **6 Claims**



1. A means for conveying particulate material comprising,

a hopper means for receiving particulate material and having an open upper end and a centrally disposed lower end,

a substantially vertically disposed material discharge conduit means having its intake end in communication with said hopper means and being centrally disposed with respect thereto,

an air conduit having its discharge end in communication with said centrally disposed lower end of said hopper means, said air conduit discharge end being spaced from the intake end of said discharge conduit means and being vertically aligned therewith so as to direct air upwardly thereinto,

blower means in communication with said air conduit so that air will be forced outwardly from said air conduit discharge end,

a valve means horizontally movably mounted in said hopper means between said discharge end of said air conduit and said intake end of said material discharge conduit means to permit the selective supply of material to said intake end of said material discharge conduit means.

3,91.,595
YANKEE DRYER HEAD AND BRACE

Stanley H. Lande, Newport News, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Apr. 23, 1974, Ser. No. 463,239
Int. Cl.² F26B *11/02*
U.S. Cl. 34—110 **8 Claims**

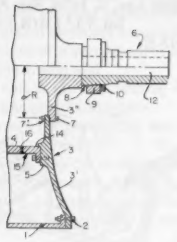
1. In a rotary pressure vessel mounted on a journal with a shell, of the type used to dry slurries and webs, a multi-component head comprising,

an inner head integral with said journal and having an outer edge including attachment means of circular shape with a radius R,

an outer head of annular shape with first and second attachment means on inner and outer edges thereof, respectively, said first attachment means of circular shape with a radius R,

said first attachment means connected to said inner head

attachment means and said second attachment means connected to said shell,



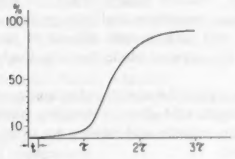
said radius R selected at or adjacent a point of inflection of bending stress in said head.

3,911,596

INDIVIDUAL ANSWERER ANSWERING TIME INTERVAL RECORDING SYSTEM FOR A TEACHING MACHINE

Satoshi Yamauchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,942
Claims priority, application Japan, Jan. 11, 1973, 48-6124
Int. Cl.² G09B *7/00*
U.S. Cl. 35—8 R **4 Claims**



1. A teaching system having a plurality of pupil stations, each station having means for providing an answer signal indicating the answer of the pupil to a question posed to the plurality of pupils, said system further having means for determining which answer signals represent correct answers and which represent wrong answers, and comprising:

means for determining a selected percentage of the pupil stations providing a defined answer signal;

means for determining the duration of the time interval from the posing of a question to the pupils until a selected percentage of the pupil stations have provided a defined answer signal;

means for generating a succession of time scale signals at a rate corresponding to the duration of said time interval; means for counting the number of said time scale signals from a time corresponding to the posing of the question; and

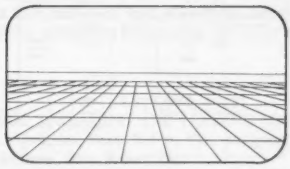
means for storing, for each pupil station, an answer time signal representing the number counted by the counting means at a time corresponding to the time the pupil station provides a correct answer signal, thereby providing an indication of the time each pupil has taken to answer the question as related to the time it has taken to receive answers from a selected percentage of the pupils.

3,911,597

SYNTHETIC TERRAIN GENERATOR

Maurice Millard; John R. Trzeciak, and Brian J. Woycechowsky, all of Binghamton, N.Y., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 108,447, Jan. 21, 1971, abandoned. This application Oct. 18, 1972, Ser. No. 298,586
Int. Cl.² G09B *9/08*
U.S. Cl. 35—12 N **14 Claims**



1. A method of simulating the view from an eyepoint in an aircraft of a grid pattern which is formed by grid lines on a synthetic terrain, said view being displayed on a viewing surface of a display unit of the type where a beam traces a raster on the viewing surface, comprising the steps of:

providing an altitude signal representative of the height of said eyepoint above said terrain;

providing attitude signals representative of the roll, pitch and heating of the aircraft;

generating sweep signals representative of the location of said raster beam on said viewing surface;

developing, from said attitude and sweep signals, earth direction cosine signals representative of a line of sight extending from said eyepoint through the location of said raster beam on said viewing surface to said synthetic terrain;

generating a video pulse in response to said altitude signal, and said earth direction cosine signals concurrently having values in accordance with a null relationship which is representative of the intersection with a grid line of said line of sight; and

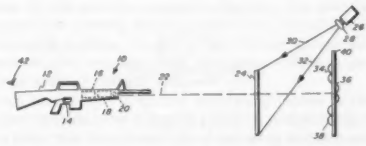
displaying the location of said raster beam in response to said video pulse.

3,911,598

LASER TYPE WEAPON FIRE SIMULATION SYSTEM

Windell N. Mohon, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1974, Ser. No. 470,416
Int. Cl.² F41G *3/26*
U.S. Cl. 35—25 **7 Claims**



1. A laser type weapon fire simulation system comprising:

a. a laser type weapon simulator including a laser means, a power source and trigger switch means to produce a laser beam when said weapon is fired at a target in simulation;

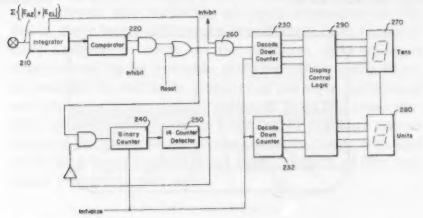
b. holographic means for producing a three dimensional virtual image of a target, and

c. a retroreflective detector screen positioned substantially coincident with said target virtual image to provide a three dimensional target and to visually indicate by retroreflection of said laser beam a score condition when said weapon is actuated.

3,911,599
GUNNER ACCURACY CONTROL PANEL

Douglas G. Talley, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 30, 1974, Ser. No. 511,555
Int. Cl.² F41G 3/26
U.S. Cl. 35—25 10 Claims

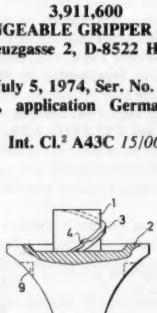


1. A Gunner's Accuracy Control Panel comprising:
means for receiving and processing an azimuth tracking error signal;
means for receiving and processing an elevation tracking error signal;
means for rectifying said azimuth tracking error signal causing all its deviations from a reference to be of like polarity;
means for rectifying said elevation tracking error signal causing all its deviations from a reference to be of like polarity;
means forming the sum of the absolute values of said azimuth and elevation tracking error signals;
means for pre selecting a time interval during which said azimuth and elevation tracking errors signals are accumulated;
means for scoring said sum of the absolute values of said azimuth and elevation tracking error signals during said pre selected time interval; and
means for displaying a tracking score attained during said pre selected time interval.

3,911,600
EXCHANGEABLE GRIPPER ELEMENT

Adolf Dassler, Kreuzgasse 2, D-8522 Herzogenaurach, Germany

Filed July 5, 1974, Ser. No. 485,814
Claims priority, application Germany, Jan. 5, 1974, 2400473
Int. Cl.² A43C 15/00
U.S. Cl. 36—67 D 12 Claims

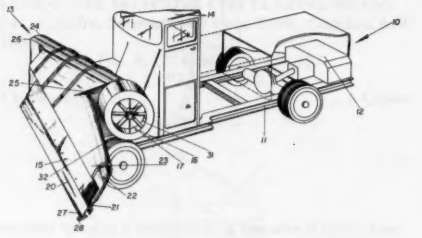


1. An exchangeable gripper element for a sports shoe, comprising a body portion of the element having a support face adapted to abut the bottom face of a shoe sole of a sports shoe, an extension projecting from said support face, said extension having a substantially cylindrical outer face, a steep thread, in the form of at least one helical element, on said substantially cylindrical outer face, and a locking element, which can be snapped into a part of complementrary shape of the sole.

3,911,601
SNOW BLOWER VEHICLE

Joseph S. Maheu, Willowdale, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1974, Ser. No. 458,665
Int. Cl.² E01B 5/00
U.S. Cl. 37—43 R 1 Claim



1. A snow blower vehicle having a chassis, a plurality of wheels movably supporting the chassis and an engine mounted on the chassis and drivingly coupled to at least some of the wheels for moving the chassis, said vehicle comprising
a snow plow assembly mounted on the front of the chassis, said snow plow assembly having an open fronted scoop and a scraper blade resiliently mounted on the lower edge of the scoop, said snow plow assembly comprising a plurality of tubular support members extending rearwardly from the scraper blade, a corresponding plurality of housings freely receiving the support members, each of the housings having rearwardly diverging side walls permitting sideways movement of the support members within the housings, resilient means within the housings acting on the support members and biasing the scraper blade downward, and jack means affixed to the scoop and coupled to the scraper blade for selectively raising said blade;
a chute at the rear of the scoop and opening onto the scoop along its length, said chute extending transverse to the length of the vehicle and having an open end and an opposite end;
motor means mounted on the chassis;
air blower means mounted on the chute at the opposite end thereof and drivably coupled to the motor means whereby the air blower means directs air under pressure through the chute from its opposite end through its open end thereby ejecting snow, ice and the like picked up by the snow plow assembly and directed into the scoop and the chute out of the open end of the chute at high velocity; and
an orifice affixed to and extending from the open end of the chute.

3,911,602
HYDRAULIC AND MECHANICAL NO-CUT EARTH WORKING MACHINE

Richard B. Trevathan, Denison, Tex., assignor to A.A. Manufacturing, Garland, Tex.

Filed Aug. 7, 1974, Ser. No. 495,319
Int. Cl.² B02J 5/06
U.S. Cl. 37—86 5 Claims

1. In an earth working machine having
a. a motor attached to a frame,
b. a hydraulic earth working implement attached to the frame,
c. a hydraulic pump driven by the motor,
d. at least one hydraulic control valve attached to the frame,
e. said control valve forming means for

i. providing hydraulic pressure from the pump to the earth working implement in one position and

ii. releasing the pressure of the pump in another position,

f. said hydraulic control valve interconnecting said pump and said earth working implement,

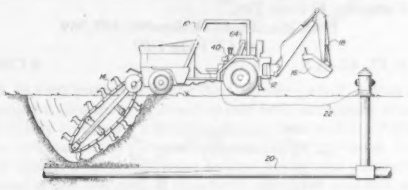
g. mechanical transmission elements mounted on the frame for selective activation of a second earth working implement attached to the frame and

h. a pedal operated clutch interconnecting the motor and said mechanical transmission elements,

i. the improved structure for preventing any earth working implement attached to the frame of the vehicle from damaging buried metal objects comprising:

j. means for detecting if any earth working implement attached to the frame is proximate the metal object,

k. a check valve attached to the outlet of said pump,



l. said check valve being means for permitting fluid flow only from the outlet of said pump to a fluid reservoir at the inlet of said pump,

m. a solenoid controlled valve connected to the outlet of said check valve,

n. said solenoid valve controlled by said means for detecting, so that said solenoid valve is open responsive to the earth working implement being proximate said metal object, and

o. a hydraulic clutch cylinder,

p. said hydraulic clutch cylinder fluidly connected between said check valve and said solenoid valve,

q. said hydraulic clutch cylinder being structurally connected to said clutch, whereby

r. opening of said solenoid valve releases the pressure upon said hydraulic clutch cylinder, thereby

s. disengaging said clutch to cease movement of said earth working implements.

3,911,603

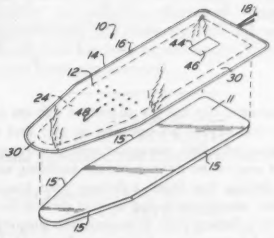
IRONING BOARD COVER

David Lehrman, Cheltenham, Pa., assignor to The Ironees Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 322,657, Jan. 4, 1973, abandoned. This application May 28, 1974, Ser. No. 473,844

Int. Cl.² D06F *81/14*

U.S. Cl. 38—140 **6 Claims**



1. A wrinkle free ironing board cover comprising a layer of heat resistant fabric, a layer of heat resistant padding which is substantially thicker than said layer of fabric, said padding including two major surfaces of substantially the same size and shape of the surface of the ironing board to be covered, said layer of fabric being adhesively bonded to substantially the entire area of one of the major surfaces of said layer of padding by a thermoplastic adhesive, such that during ironing, softening of said adhesive occurs at about **200°–250°** F., allowing the cover to be maintained in a wrinkle free condition, said layer of fabric having the same shape but being larger in size than the layer of padding, the portion of said layer of fabric between said padding and the edges of said layer of fabric defining a marginal skirt, said skirt being integral with said layer of fabric, and means for securing said cover to an ironing board.

3,911,604

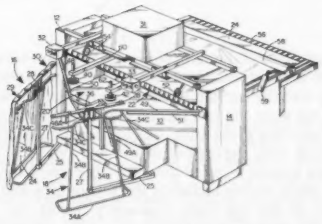
FABRIC SPREADING AND FEEDING MACHINE

Robert L. Sjostrom, Boca Raton, Fla., assignor to Kathleen Alice Sjostrom, Boca Raton, Fla.

Filed Jan. 20, 1975, Ser. No. 542,353

Int. Cl.² D06F *67/04*

U.S. Cl. 38—143 **21 Claims**



1. A feeder spreader for feeding, spreading and smoothing large textile sheets in the order of magnitude in size in bedsheets to receiving apparatus such as continuous ironers or the like comprising,

belt means having an upper surface to receive successively fed sheets in spread condition,

means for actuating said belt means to carry sheets fed thereon in a rearward direction,

a pair of elongated arms,

means pivotally supporting said pair of elongated arms above said belt means for movement between a position substantially parallel and in a position at an acute angle to the direction of movement of said belt means,

a pair of clamp means for releasably engaging adjacent corners of a textile sheet,

means slidably supporting said clamp means, one each to each of said arms, each for movement along a length of one of said arms in a section adjacent a free end thereof, means for pivoting the free ends of said arms from a sheet engaging position forward of the forward end of said belt means over opposed arcs to a sheet releasing position over said belt means, and

means sequentially actuating said clamp means to clamp a sheet in said clamp engaging position, said pivoting means to pivot said arms to said sheet releasing position and said clamping means to release said sheet in said sheet releasing position.

3,911,605

COUPON HOLDER

George C. Morhack, 4062 Hessen Cassel Road, Fort Wayne, Ind. 46806

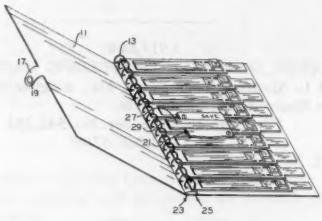
Filed Jan. 24, 1974, Ser. No. 436,050

Int. Cl.² G09F *11/06*

U.S. Cl. 40—102 **3 Claims**

1. A one-piece flexible molded plastic scrip clip having generally planar elongated outer and inner portions with the

outer portion comprising a generally rectangular clip body having means near one end thereof for attaching the scrip clip to a protective cover, and the inner portion comprising a generally rectangular clip leaf free on three sides thereof and a leaf tab, the leaf tab being integral with the clip leaf along at least a portion of the fourth side of the clip leaf with the leaf tab having a free end extending away from the clip leaf, the inner and outer portions having a pair of common portions near opposite ends of the clip leaf fourth side and forming a pair of flexible torsion ribs to support the inner portion relative to the outer portion, the clip leaf being deformed out of



the general plane of the scrip clip in a first region with the free end of the clip leaf extending through the general plane of the clip body and the leaf tab being deformed out of the general plane of the scrip clip in a second region with both deformed regions extending in the same direction from the general plane of the scrip clip, depression of the leaf tab second region toward the general plane of the scrip clip causing the clip leaf to pivot about means including the torsion ribs and through the plane of the clip body torsionally flexing the ribs and allowing the placement of scrip between the clip leaf and the clip body after which the leaf tab may be released and the scrip flexibly secured between the clip leaf and the clip body.

3,911,606

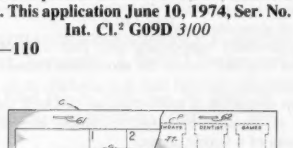
CALENDAR KIT AND METHOD OF USE

James J. Hunkins, 13001 Aclare Place, Cerritos, Calif. 90701

Continuation-in-part of Ser. No. 341,321, March 14, 1973, abandoned. This application June 10, 1974, Ser. No. 477,655

Int. Cl.[2] G09D *3/00*

U.S. Cl. 40—110 **6 Claims**



1. A reminder calendar kit comprising, in combination: a rectangular backing sheet made of relatively flexible cardboard material;

a plurality of rectangular calendar sheets made of relatively flexible cardboard material, all of said calendar sheets being of substantially the same size as said backing sheet; means fastening all said sheets together along one edge thereof, whereby said one edge may be utilized for suspending the calendar kit;

each of said calendar sheets having individual date spaces arranged in vertical columns and horizontal rows to provide the dates for one month;

each of said calendar sheets having a plurality of rectangular slits formed therein, one associated with each of said date spaces, all of said slits extending parallel to said one edge of said calendar kit;

said backing sheet having at least one T-shaped reminder tab formed by perforation lines therein; and

all of said slits having a length which is greater than the width of the lower portion of said reminder tab and less than the width of the upper portion thereof;

whereby the user of said calendar kit may remove said reminder tab from said backing sheet and insert the lower portion thereof into the slit associated with a selected date space of one of said calendar sheets.

3,911,607

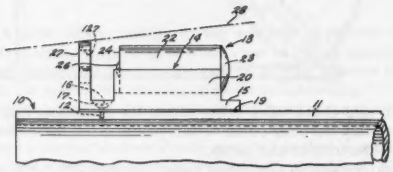
FRONT SIGHT CONSTRUCTION FOR FIREARMS

George C. Luebkeman, Cleves, Ohio, assignor to W. R. Weaver Company, El Paso, Tex.

Filed Jan. 28, 1974, Ser. No. 437,369

Int. Cl. F41g *1/02*

U.S. Cl. 42—1 S **6 Claims**



1. A front sight for a firearm barrel having a breech end and a muzzle end comprising a mount having a base, means positioning the base of the mount upon the muzzle end of the barrel, side walls extending upwardly from the breech end of the base, a fragile lens sight member positioned on the base between and extending above the side walls, and a guard one-piece with the base and extended upwardly from the muzzle end of the base and spaced forwardly from the muzzle end of the fragile lens sight member, said guard having an outline projecting outside of the longitudinal extension lines of the fragile lens sight member.

3,911,608

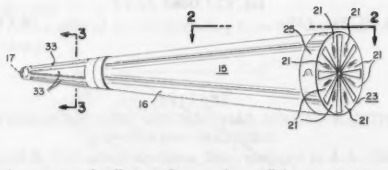
AUTOMATIC DIP NET

John H. Holling, 416 Grove Ave., Ukiah, Calif. 95482

Filed Dec. 13, 1973, Ser. No. 424,478

Int. Cl.[2] A01K *97/14*

U.S. Cl. 43—5 **3 Claims**

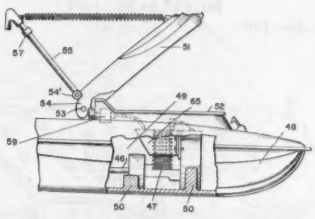


1. An automatic dip net for snaring a fish on a hook comprising a device having an opening at one end of a size to permit entrance of a fish, means at said end for snaring a fish entering said end of the device, means enabling said device to slide along fishing line from a fishing pole toward a baited hook in water, means included in said device for supporting said device on a fishing pole with such line running through it, a fishing pole having means for suspending said device therefrom, said last means enabling release of said device from said pole in response to a tug on said line, to free it for sliding down said line.

3,911,609
INSTRUMENT FOR REMOTE FISHING

Jose Pena Baya, Masnou St. 9, Barcelona, Spain

Filed Feb. 26, 1973, Ser. No. 335,888
Claims priority, application Spain, Feb. 28, 1972, 400666
Int. Cl. A01k *93/00*
U.S. Cl. 43—26.1 **9 Claims**



1. In a self propelled fishing float including a hull, outwardly opening casing means carried by said hull, said casing means releasably containing a sinker and hook attached to a fishing line, release means for releasing said sinker and hook from said casing, a motor having a control linkage, an adjustable, wound spring and gearing type timer carried by said hull, and means interconnecting said sinker, hook releasing means and said timer to cause release of said sinker and hook after a predetermined time interval, the improvement comprising:

A. a winding and output motion shaft on said timer;

B. an actuating cam for said release means, said actuating cam being mounted on said shaft and engageable with said release means upon unwinding of the spring of said timer and rotation of the timer gearing after a predetermined time interval;

C. said timer including a first gear attached to said shaft, said first gear having an undercut section wherein no teeth are provided, said first gear engaging other timer gearing which effectively brakes free rotation of said first gear in a manner known per se except when said undercut portion of said first gear is presented to said other gearing, at which time said first gear and shaft are free to rotate within a prescribed limited arc;

D. windable spring means connected to said shaft in said timer and means for winding said spring to initiate a controlled, spring driven rotation of said shaft, said shaft being free to rotate under the impulse of said spring free of said other timer gearing when said undercut section of said first gear is presented to said other timer gearing;

E. a motor control pawl connected to said shaft and rotatable therewith, and engageable with said motor control linkage to activate said linkage to a motor shut off position, the angular orientation of said pawl with respect to said shaft, said first gear and said release means actuating cam being such that the motor is shut off during free rotation of said shaft under the impulse of said spring substantially immediately when said release means is actuated, whereby said motor control linkage is driven to the shut off position by a rapid impulse stroke when said sinker and hook are released.

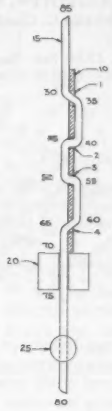
3,911,610
SLIP AND LOCK STOP

Harold Thomas Goodman, 106 Lancelot Drive, Franklin, Ind. 46131

Filed June 19, 1974, Ser. No. 480,741
Int. Cl.² A01K *91/00*
U.S. Cl. 43—43.1 **10 Claims**

1. A stop for a bobber sliding on fishing line, said stop comprising:

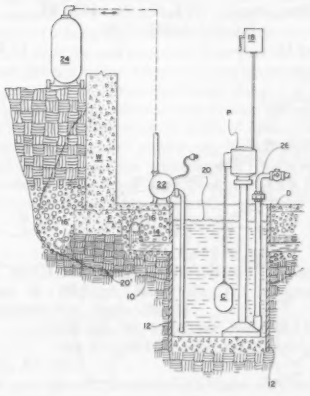
an elongated flat piece of flexible substantially non-stretchable material having four holes therein substantially aligned in a row, the two end holes in the row being of a diameter greater than the diameter of the largest fishing line with which the stop may be used, and the two intermediate holes being of a diameter smaller than the largest line with which the stop may be used, but larger than the smallest line with which the stop may be used, the thickness of said material and size and spacing of said holes being such as to securely retain by friction said stop in a fixed position on a fishing line threaded through said holes in succession and yet permit a force deliberately applied externally to said line and to said stop by gripping between a finger and thumb to slide said stop endwise along said line.



3,911,611
METHOD OF DISPERSING PESTICIDE FLUID

Harry Brinker, 6305 McClean Blvd., Baltimore, Md. 21214

Filed July 8, 1974, Ser. No. 486,571
Int. Cl.² A01M *17/00*
U.S. Cl. 43—124 **8 Claims**



1. The method of dispersing fluid pesticide to form a pesticide barrier adjacent the foundation of a building having a preexisting footing drainage system, said drainage system including a first conduit portion containing access openings and arranged in fill material adjacent the building foundation, and a second conduit portion for normally discharging fluid from said first conduit portion, which comprises the step of

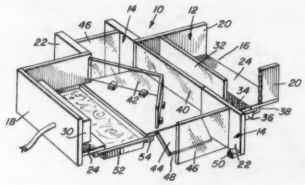
introducing into the first conduit portion a quantity of fluid pesticide at sufficient pressure to force said fluid pesticide outwardly from said first conduit portion via said access openings into said fill material.

3,911,612

APPARATUS FOR DESTROYING SAPYGA WASPS

Larry D. Sorenson, and Melvin G. Goodson, both of Rte. No. 1, Parma, Idaho 83660

Filed June 7, 1974, Ser. No. 477,522
Int. Cl.² A01M *1/04*
U.S. Cl. 43—132 R **6 Claims**



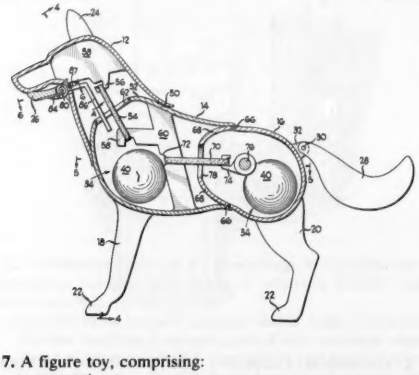
1. Apparatus for selective destruction of insects comprising an insect passage, an insect receiving entrance at one end of the passage, the second end of the passage being closed, attracting means for inducing movement of insects along said passage, means for diverting selected insects outward of said passage, insect destroying means within said passage beyond the means for diverting selected insects and before the attracting means, said passage including a floor, said means for diverting selected insects including a diverting barrier transversely across said passage and spaced above the floor thereof a predetermined distance sufficient so as to allow passage of all but selected insects, and a lateral discharge passage arranged laterally of the insect passage before the diverting barrier, attracting means and insect destroying means.

3,911,613

ARTICULATED FIGURE TOY AND ACCESSORIES

Howard J. Morrison, Deerfield, and Rouben T. Terzian, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 15, 1974, Ser. No. 442,785
Int. Cl.² A63H *11/00*
U.S. Cl. 46—116 **11 Claims**



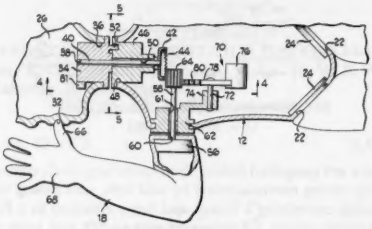
7. A figure toy, comprising:
a torso portion;
a head portion movably mounted on the torso portion;
a mouth portion in the form of a lower jaw mounted on the head portion in a normally closed disposition; and
means operatively interconnecting the lower jaw and the torso portion to move the lower jaw to an open disposition relative to the head portion in response to movement of the head portion relative to the torso portion.

3,911,614

ANIMATED DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 29, 1973, Ser. No. 327,326
Int. Cl.² A63H *11/00*
U.S. Cl. 46—120 **3 Claims**



1. An animated doll, comprising:
a torso portion;
a head rotatably mounted on top of said torso portion and including a mouth area, said head being movable relative to the torso portion in a twisting fashion between a front facing position and a side facing position;
an arm mounted on the side of said torso portion generally in a shoulder area thereof, said arm having a hand at the end thereof and being movable about a generally side-to-side axis relative to the torso portion between a lowered position and a raised position wherein said hand is generally at said mouth area when said head is in its side facing position; and
drive means including a gravity influenced pivotally mounted pendulous member operatively associated with said head and said movable arm for simultaneously moving the head from its front facing position to its side facing position while at the same time moving said movable arm from its lowered position to its raised position in response to movement of said pendulous member whenever said doll is moved from a generally vertically disposed erect position to a generally horizontally disposed prone position.

3,911,615

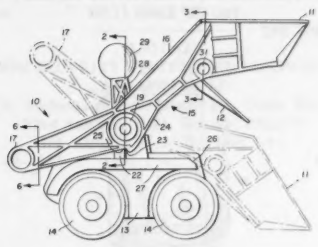
TOY SCOOP LOADER

James C. Alexander, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed July 24, 1974, Ser. No. 491,341
Int. Cl.² A63H *33/30*
U.S. Cl. 46—40 **22 Claims**

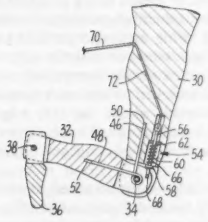
1. In a toy scoop-loader having a wheeled chassis, the improvement comprising:
a. a frame having a pair of spaced-apart arms extending fore and aft relative to said chassis;
b. means for pivotally supporting a longitudinal mid-region of said frame on said chassis;
c. a scoop bucket on a forward end of said frame;
d. a handle extending between said arms at a rearward end of said frame for manipulating said frame;
e. means for supporting said frame in a scooping position with said bucket lowered and said handle elevated for manually moving and guiding said bucket;
f. frame latch means for releasably supporting said frame in a lifting position with said bucket elevated and said handle lowered;

g. a bucket bottom pivotally mounted for opening and closing said bucket;
h. a manually operable lever mounted for pivoting relative to said frame;



i. a connecting rod extending between said bucket bottom and said lever for pivotally opening and closing said bucket bottom in response to movement of said lever; and
j. bucket bottom latch means for releasably latching said bucket bottom in said closed position.

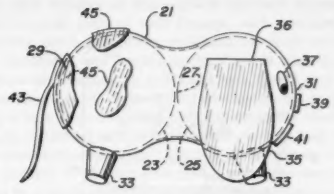
3,911,616
TOY FIELD GOAL KICKER
Raymond H. Pelfrey, P.O. Box 1168, Zephyr Cove, Nev. 89448
Continuation of Ser. No. 295,176, Oct. 5, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,540
Int. Cl.² A63H *13/02*
U.S. Cl. 46—128 **3 Claims**



1. A toy football field goal kicking device comprising a base, an upstanding figure mounted on the base having a support leg and a non-support leg, the latter comprising a lower limb portion pivotally attached at the knee about a first horizontal axis and a foot portion pivotally attached to the limb portion at the ankle about a second horizontal axis parallel to the first axis, releasable clamping means for selectively adjusting the included angle between the limb and foot portions to thereby control the trajectory of a football kicked by said foot portion, and spring means carried by said non-support leg and operable to drive said limb portion from a rearwardly directed, raised, pre-kick position to a forwardly directed, raised, follow-through position.

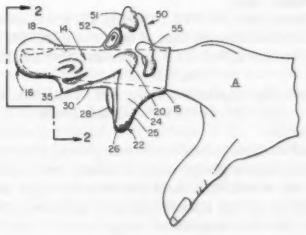
3,911,617
DECORATIVE ARTICLE COMPRISING KNIT STRETCH MATERIAL
George Edwin Gelfand, 1005 Vine Ave., Scranton, Pa. 18510
Filed June 17, 1974, Ser. No. 479,880
Int. Cl.² A63H *3/00*
U.S. Cl. 46—151 **7 Claims**

1. A caricatural construction of a live figure comprising a tube of stretch-type knit material having an unstretched diameter in its unstretched condition, said, tube containing only two substantially spherical touching solid objects each having a diameter which is at least one and one-half times said unstretched diameter, one of said objects having a recess therein, at the point of touching, said solid objects being freely movable with respect to each other, said tube being closed upon



itself at both ends and being stretched in both its longitudinal and transverse directions to effect said closure, and a plurality of indicia attached to the outside of said tube conveying the appearance of a live entity.

3,911,618
FINGER PUPPET
Joel Lee Gerst, 1224 Evelyn Ave., Berkeley, Calif. 94706
Filed Dec. 19, 1974, Ser. No. 534,259
Int. Cl.² A63H *3/14*
U.S. Cl. 46—154 **10 Claims**

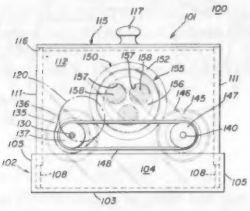


8. A finger puppet for mounting on a single digit having animated facial expression responsive to flexure of said single digit comprising: a hollow elastic diaphragm defining interiorly thereof a main digit receiving concavity for receiving the mounting digit for said puppet at least past the first digit joint; a mouth defined on the exterior of said diaphragm underneath the digit and in the direction of digit flexure; a jaw protuberance defined by a protuberance extending away from the main digit receiving concavity at the point of flexure of said mounting digit; and, a pallet portion on the exterior of said diaphragm adjacent said jaw protuberance for movement toward said pallet portion upon digit flexure of said hollow elastic diaphragm as mounted to said mounting digit.

3,911,619
SEED SPROUTER AND INSERT THEREFOR
Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.
Filed July 26, 1974, Ser. No. 492,174
Int. Cl.² A01G *31/02*; A01C *1/02*
U.S. Cl. 47—14 **15 Claims**

1. A seed sprouter comprising a frame, support structure on said frame mounting a container for turning about a horizontal axis, carrier structure in said container for holding seeds a predetermined distance from the horizontal axis, a motor mounted on said frame for driving said support structure to turn said container and the carrier structure therein about the horizontal axis at a speed to nullify the effects of gravity on the growth of seeds carried by said carrier structure, and an annular trough in said container for holding a body of water

through which the seeds are passed as said support structure turns about the horizontal axis, whereby the seeds on said



carrier structure are alternately watered and aerated as said support structure turns.

3,911,620

MATERIALS WITH A SPECIFIC PHOTO-SELECTIVITY BASED ON SYNTHETIC THERMOPLASTIC POLYMERS AND THEIR USE IN THE AGRICULTURAL FIELD

Flaviano Glatti, Mestre, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 798,781, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 603,388, Dec. 20, 1966, Pat. No. 3,542,710. This application May 21, 1971, Ser. No. 145,862

Claims priority, application Italy, Feb. 14, 1968, 12723/68

Int. Cl.[2] A01G *9/14;* **C08F** *29/18*

U.S. Cl. 47—58 **2 Claims**

2. An enclosure for a cultivation comprising a tinted nonfluorescent translucent plastic sheet material and exposing the cultivation to transmitted sunlight only through said sheet material, the minimum transmittance of said sheet matermial lying within one of the spectral ranges:

4,100 A to 4,500 A,

4,900 A to 5,400 A, and

5,250 A to 5,750 A,

said sheet material having a transmittance maximum in excess of 50% within the spectral zone of 6,300 A to 6,600 A and in excess of 70% in the spectral zone of 6,600 A to 7,500 A, the transmittance being defined as the ratio in percent of transmitted-light intensity to incident-light intensity of the particular frequency, said sheet material including a polymeric component selected from the group which consists of polyvinylchloride, polyethylene, polypropylene, polymethylmethacrylate, ethylene-vinyl acetate copolymers, polyamides, copolymers and mixtures thereof, a dyestuff constituting 0.00001 to 5 parts by weight per 100 parts by weight of said polymeric component, and at least one additional component selected from the group which consists of:

a stabilizing component present in an amount ranging from 0.5 to 10 parts by weight per 100 parts by weight of said polymeric component;

a co-stabilizing component effective against heat and light and present in an amount ranging from substantially 0 to 30 parts by weight per 100 parts by weight of said polymeric components;

an ultraviolet ray absorbing component present in an amount ranging from substantially 0 to 2 parts by weight per 100 parts by weight of said polymeric component;

a plasticizing component present in an amount ranging between 0 and 100 parts by weight of said polymeric component; and

a lubricating component present in an amount ranging from 0 to 5 parts by weight per 100 parts by weight of the polymeric component.

3,911,621

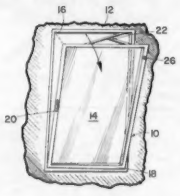
MULTI-PURPOSE WINDOW

Murray Parker McHeffey, Little Silver, N.J., assignor to Extrudart Metal Products Inc., Clifton, N.J.

Filed Oct. 23, 1973, Ser. No. 408,604

Int. Cl.[2] E06B *11/00*

U.S. Cl. 49—192 **1 Claim**



1. A multi-purpose window mechanism capable of being tilted with the top open for ventilation purposes and swung open by pivoting on a side thereof comprising

a sash member having a movable control means,

a frame member cooperating with said sash member, said frame member being fixed to the structure in which the window is mounted,

tilting means attached to said frame and sash members to enable said sash member to tilt about a horizontal axis to permit an opening at the top of the window for ventilation purposes,

swing means attached to one side of said sash and said frame to permit the sash member to swing open about one side thereof,

said movable control means being attached to said window mechanism for selectively engaging either said tilting means or said swing means to tilt said sash member or swing-in said sash member, respectively,

said movable control means comprising a manually controlled handle attached to said sash member, a movable drive train movable about the side edges of the sash member, said handle coupled to said drive train to move said drive train to slectively engage said tilt means or said swing means,

a key operated lock means attached to said sash member being remotely located from said handle, said key operated lock means capable of preventing said sash member from being swung inwardly by other than as authorized individual,

said key operated lock means comprising a latch means, said latch means including a finger member being movable by a key into a blocking position to block movement of the train and prevent said handle from being moved to a position for engaging said swing means,

said tilt means comprising at least a pair of pivot means located on opposite bottom corners of said window,

wherein said control means further comprises a projecting member attached to said handle to be moved thereby, said drive train being located in said sash member and including a drive plate having a recess adapted to receive said projecting member, said projecting member bearing against the recess in the drive plate to move said drive train,

said handle being movable from a center to two other positions, the first of said other positions allowing for a tilting operation, the center position allowing for a closed window position, and the second of said other positions enabling said sash member to swing about a side thereof, said swing means including at least a pair of pivot means, at least one of said pivot means comprising fixed and movable cooperating members, said movable cooperating member being driven by said drive train means,

further comprising keeper means fixedly attached to said frame and pin means movable by said train member into blocking engagement with said keeper to prevent said

sash from swinging when said train movement is blocked by said lock means, and

wherein said lock means is located at one end of said drive train, said finger member being movable against said one end of said drive train to block movement of said drive train.

3,911,622

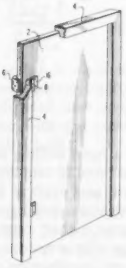
DOOR SECURITY SYSTEM AND METHOD OF ATTACHING IT

Peter J. H. Prohaska, Rte. 5, Box 683-A, Ocala, Fla. 32670

Filed Aug. 12, 1974, Ser. No. 496,675

Int. Cl.² E05D *11/00*; **E06B** *7/16*

U.S. Cl. 49—383 **13 Claims**



1. A security system for preventing removal of a hinged door from an opening in a doorframe upon removal of a hinge connection between the door and the doorframe, said security system comprising,

a stationary member having a base portion and a stationary abutment portion projecting from the base portion, said stationary abutment portion having a stationary abutment surface, means for mounting the base portion of the stationary member on a doorframe interiorly of the door at a position where the stationary abutment portion extends laterally from the doorframe into the opening on the interior side of the door,

a movable member having a movable abutment surface which is in facing relationship to the interior side of the door, means for mounting the movable member on the interior face of a door at a position fixed with respect to the door where the movable abutment surface overlaps the interior side of the stationary abutment portion when the door is in its closed position to prevent the hinged edge of the door from being pulled in an exterior direction when the hinge connection is removed therefrom; said movable abutment surface being movable with the door upon opening of the door from a closed position, past an intermediate position where the spacing between said stationary abutment portion and the movable abutment surface is at a minimum, to a door-open position laterally displaced from the stationary abutment, said abutment surfaces having extreme portions which lie substantially parallel to each other when the door is at said intermediate position.

3,911,623

WINDOW STRUCTURE

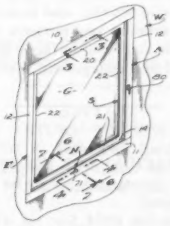
Edward M. Walter, 323-1/4 W. Francisco St., Carson, Calif. 90745

Filed Jan. 13, 1975, Ser. No. 540,677

Int. Cl.² E06B *3/40*

U.S. Cl. 49—390 **10 Claims**

1. A window structure comprising a rectangular window frame with horizontal top and bottom sections and vertical side sections, a rectangular sash frame with horizontal top and bottom members and vertical side members freely engageable within the window frame and supporting a glass pane, said sash frame and pane normally occurring in a closed position wherein said sash and window frames are in a common vertical plane, upper and lower, pivotal mounting means at and between the top section and member and between the bottom section and member of the window and sash frames on the central vertical axes of said frames, said mounting means comprising pivot pin plates mounted on their related sash frame members and having vertical pivot pins projecting therefrom and outwardly from the sash frame and receiver fixtures mounted on their related window frame sections and having a boss with a bearing opening rotatably receiving the pivot pin of the related pivot pin plate, one of said mounting means including stop means to stop pivotal opening of the sash frame relative to the window frame when the sash frame is pivoted to a predetermined partially opened position and the plane of the sash frame is angularly related to the plane of the



window frame a predetermined number of degrees, said stop means comprising a key plate shiftably carried by the boss on a plane parallel with the axis of the pin and normally occurring radially outward of the pin, spring means normally yieldingly urging the key plate toward the pin, a longitudinal radially outwardly opening keyway in the pin normally on a radial plane angularly related to the plane of the key-plate equal to the angular relationship of the frames when in said partially open position and shiftable into alignment with the key plate when the frames are moved to said partially open position, whereupon the plate is urged by the spring means inwardly into stopping relationship in the keyway in the pin and manually operable operating means to yieldingly urge the key plate outward relative to the keyway and against the force of said spring means and manually operable latch means between the frames, spaced from the mounting means to releasably hold the frames in their normal, closed position.

3,911,624

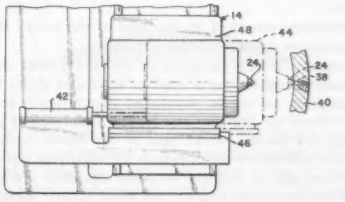
POLISHING APPARATUS

Raymond Happy, Wayne, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1974, Ser. No. 521,783

Int. Cl.² B24B *19/00*, *53/04*

U.S. Cl. 51—5 D **3 Claims**



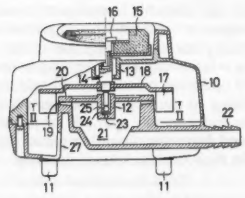
1. An apparatus for polishing intersecting aperture and wall surfaces including a frame movably supporting a rotating polishing head for independent movement both in vertical and horizontal directions, said polishing head comprising a housing, a spindle rotatably mounted in said housing, a collet

positioned within said spindle for rotation therewith, an elongated abrasive member adjustably retained within said collet, mating surfaces on said spindle and said collet engaging and retaining said abrasive member in an adjusted position within said collet, spring means normally biasing said surfaces into engagement for retaining said collet within said spindle, collet release actuating means positioned on said frame at a predetermined location, positioning means on said frame moving said polishing head between working and abrasive adjusting positions, said collet being aligned with said collet release means when said polishing head is at the abrasive adjusting position, said collet release means being selectively actuated to move said collet against the force of said spring means extending said abrasive member out of said collet a predetermined distance compensating for wear of said abrasive member, means for feeding said polishing head toward a workpiece when said head is at the working position, a driven gear drivingly connected to said spindle, and power means drivingly engaging said gear rotating said abrasive member polishing intersecting aperture and wall surfaces when said abrasive member is advanced into engagement with a workpiece.

3,911,625
GRINDING MACHINE FOR HOUSEHOLD USE

Minoru Ise, Osaka, Japan, assignor to Ise Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1974, Ser. No. 473,181
Claims priority, application Japan, June 1, 1973, 48-65391
Int. Cl.² B29B *3/36*
U.S. Cl. 51—109 R **4 Claims**



1. A grinding machine for household use comprising: a housing to be installed in a desired place, a rotary shaft rotatably supported by the housing in an axially displaceable manner,

a whetstone mounted on one end of the rotary shaft and having an exposed abrasive surface,

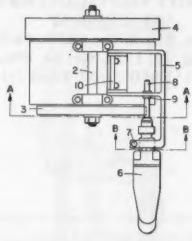
an impeller fixedly mounted on the rotary shaft within the housing and having a number of blades along its outer periphery, a nozzle positioned diametrically inside the blades of the impeller and having a plurality of jet openings for forcing water against the blades substantially perpendicular thereto, means for supplying tap water to the nozzle, a uniform pressure chamber provided between the nozzle and the tap water supply means, and

means for urging the rotary shaft axially thereof in counteracting relation to the pressing force exerted on the abrasive surface by an article to be sharpened, said urging means including means directing pressure of said tap water from said pressure chamber toward part of the rotary shaft carrying the impeller.

3,911,626
ROLLING FRICTION DRIVE DEVICE

Torgny Jansson, 17A Norevagen, Lindesburg, Sweden (S-711 00)

Filed Oct. 18, 1973, Ser. No. 407,731
Int. Cl. B24b *5/00*; **F16h** *13/00*
U.S. Cl. 134.5 R **3 Claims**



1. In combination, a hand drilling machine, a tool, and a device for coupling said tool to said drilling machine to cause said machine to rotate said tool at a relatively low speed compared to the speed of the drilling machine, said coupling device including a frame, a shaft rotatably supported by the frame, said tool being affixed to one end of said shaft for rotation therewith, a circular friction disc of relatively large diameter affixed to the other end of said shaft for rotating the shaft and tool, a bracket having a first leg provided with means for mounting said hand drilling machine thereon, said bracket including a second leg spaced from said first leg and provided with a bearing, said first and second legs being disposed in facing relation to opposing sides of said friction disc respectively, said bearing being aligned with the center of the chuck of the drilling machine in its mounted position, a relatively small diameter smooth surfaced driving shaft having one end mounted in said bearing, the other end of said driving shaft being fastened in the chuck of said drilling machine, said bracket being swingably supported from said frame so that gravity forces said driving shaft towards the periphery of the friction disc to cause the outer surface of said driving shaft to directly contact the periphery of said disc at a position between the bearing and the chuck, the direction of rotation of the drilling machine being such that the torque of said driving shaft further presses said driving shaft against the periphery of the friction disc.

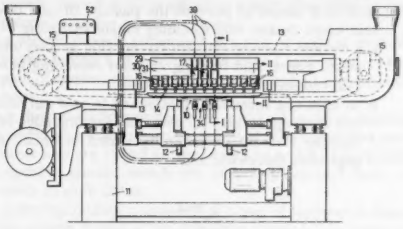
3,911,627
BELT GRINDING MACHINE ADAPTED TO GRIND A FLAT OR CURVED SURFACE

Karl Heesemann, 54 Friedenstr., 4970 Bad Oeynhausen-Rehme, Germany

Filed Apr. 15, 1974, Ser. No. 460,722
Claims priority, application Germany, Apr. 21, 1973, 2320345
Int. Cl.² B24B *21/16*
U.S. Cl. 51—137 **9 Claims**

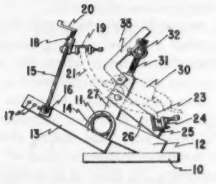
1. A belt grinding machine comprising a frame, conveying means on said frame for conveying workpieces to be ground along a first path, endless grinding belt means operably overlying said first path, a flexible pressure member overlying a portion of said belt means and extending transversely entirely across said first path, a support member fixedly mounted on said frame overlying said pressure member, a plurality of motor means having cylinders supported upon said support member and plunger means displaceable within said cylinders and engageable with spaced portions of said pressure member for pressing said pressure member against said belt means to press said belt means against workpieces conveyed along said first path, mounting means mounting at least some of said cylinders on said support member for movement toward and

away from said pressure member, a plurality of first control means respectively coupled to each of said motors for independently displacing the plunger means of each motor to provide grinding pressure, and a plurality of second control



means respectively coupled to each of said at least some of said cylinders for independently shifting the individual last mentioned cylinders toward and away from said pressure member in accordance with the curvature of a workpiece longitudinally of said first path.

3,911,628
SHARPENING JIG FOR RECUTTER SCREEN
Earl W. Paulsen, P.O. Box 22, Round Lake, Minn. 56167
Filed Mar. 6, 1974, Ser. No. 448,528
Int. Cl.² B25B *1/22*
U.S. Cl. 51—217 R **2 Claims**



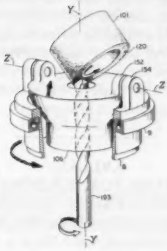
1. For holding a recutter screen having an arcuate body terminating in an edge on one end of the arc and a flange on the opposite end, a grinding jig comprising a base, flange holding means mounted on said base adapted to hold said flange, edge holding means on said base including an arm pivotally mounted on said base, rod means pivoted to said arm and threaded at one end, said rod being rotatable, clamp means threadably engaged with said rod and adapted to hold said edge of the screen whereby rotation of said rod results in adjustment of the edge, and grinder mounting means movably mounted from said base whereby a grinder can sweep across the face of said screen.

3,911,629
METHOD FOR SHARPENING DRILLS AND OTHER CUTTING TOOLS
John C. Steinmetz, P.O. Box 672, Coer D'Alene, Idaho 83814
Continuation-in-part of Ser. No. 259,589, June 5, 1972, Pat. No. 3,838,540. This application Apr. 8, 1974, Ser. No. 459,117
Int. Cl.² B24B *1/00*
U.S. Cl. 51—288 **12 Claims**

5. A method for sharpening a tool comprising the steps of:

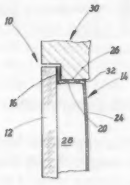
providing a grinding surface,

providing a cutting tool having an axis and at least one cutting edge with a relieved portion, moving said tool relative to said grinding surface to grind said cutting edge with said relieved portion, said movement including rotating said tool about an axis which extends in generally the same direction as the tool axis, said axis of rotation being at least partially out of alignment with said tool axis during at least a portion of said rotation, said movement also



including tilting the tool about a second axis which extends generally normal to said axis of rotation.

3,911,630
STORM WINDOW
Phillip L. Nally, 302 W. Muir Ave., Bardstown, Ky. 40004
Filed July 26, 1974, Ser. No. 492,032
Int. Cl.² E06B *3/28*
U.S. Cl. 52—2 **7 Claims**



1. A storm window comprising: a rigid self supporting transparent sheet held in position over a window opening and a transparent flexible bladder portion having sides, edges and a back portion to define with said transparent sheet a cubic rectangularly shaped inflatable dead air space, said edges and said sides including gripping means integral therewith to enhance the attachment of said storm window over said window opening the combination thereby providing a see-through heat insulator across the window opening.

3,911,631
INFLATABLE BUILDING STRUCTURE
Richard F. Cooper, 104 Mountain View Road, Trenton, N.J. 08628
Filed Feb. 12, 1974, Ser. No. 441,902
Int. Cl.² E04B *1/345*
U.S. Cl. 52—2 **3 Claims**

1. An air inflatable building structure comprising, a generally rectangular cover fixed to a horizontal support, said cover comprising a plurality of elongated first strips of synthetic polymeric material of constant width, a plurality of elongated second strips of synthetic polymeric material of constant width interwoven with said first strips at right angles thereto, the overlapped portions of said interwoven strips being adhesively secured together thereby rendering said cover substantially fluid impervious, first opposite ends of said cover having said first strips extending freely outwardly of said second

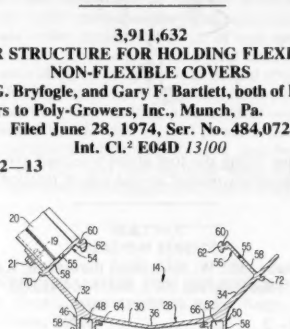
strips, the remaining opposite ends of said cover having said second strips extending freely outwardly of said first strips, tie-down means for said cover engaging with each of said outwardly extending strips, said tie-down means including hollow tubes, flexible sleeves surrounding said tubes, at least one of said outwardly extending strips being disposed between one of said tubes and one of said sleeves, C-clamps tightly engaging said sleeves for retaining said outwardly extending strips in place, and a flexible cable extending through said tubes and being secured to said support.

3,911,632

GUTTER STRUCTURE FOR HOLDING FLEXIBLE AND NON-FLEXIBLE COVERS

Kenneth G. Bryfogle, and Gary F. Bartlett, both of Muncy, Pa., assignors to Poly-Growers, Inc., Munch, Pa.

Filed June 28, 1974, Ser. No. 484,072
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—13 **15 Claims**



1. A gutter for use with either flexible or non-flexible cover materials comprising:

a. an elongated web having a first longitudinally extending sidewall, a second longitudinally extending sidewall, and a longitudinally extending central portion connecting the sidewalls;

b. a first mounting plate depending from the web on one side of the central portion and a second mounting plate depending from the web on an opposite side of the central portion for securing the gutter to a support post;

c. a first mounting bracket depending from the web and spaced outwardly of and adjacent to the first mounting plate to form a first recess therewith and a second mounting bracket depending from said web and spaced outwardly of and adjacent to the second mounting plate to form a second recess therewith, with the recesses being capable of receiving a non-flexible cover material; and

d. a third mounting bracket on the first sidewall of the web, said third bracket extending inwardly toward the center axis of the web to form a shelf with the first sidewall and a fourth mounting bracket on the second sidewall of the web, said fourth bracket extending inwardly toward the center axis of the web to form a shelf with the second sidewall, the first, second, third and fourth mounting brackets each including means for securing a flexible cover thereto.

3,911,633

AWNING OR PATIO COVER MOUNTING APPARATUS

Larry F. Bamberger, Tucson, Ariz., assignor to Westerner Products, Inc., Tucson, Ariz.

Filed July 22, 1974, Ser. No. 490,773
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—75 **4 Claims**

1. Awning or patio cover attachment apparatus for sealably mounting a rigid awning panel to a support wall with minimal need for caulking, comprising:

a. a unitary awning rail member attachable to the support wall;

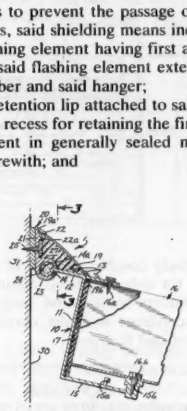
b. an awning hanger for supporting the awning panel, said hanger attached to the edge of the awning panel which is adjacent the support wall;

c. hinge means for pivotally attaching said hanger to said rail member;

d. shielding means to prevent the passage of rain through said hinge means, said shielding means including:

i. a flexible flashing element having first and second opposed edges, said flashing element extending between said rail member and said hanger;

ii. at least one retention lip attached to said rail member and forming a recess for retaining the first edge of said flashing element in generally sealed mechanical engagement therewith; and



iii. at least one cleat member attached to said awning hanger and forming a recess for retaining the second edge of said flashing element in generally sealed mechanical engagement therewith;

e. non-mastic means for attaching said flashing element to said rail member and said awning hanger in a generally sealed relationship thereto when the awning frame is positioned in any one of several pitch orientations; and

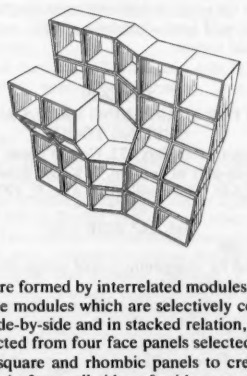
f. a flexible, non-mastic water resistant sealing element sealably attached to said rail member and abuttable against the support wall, said sealing element being compressible to conform to the contour of the support wall thereby preventing the flow of moisture therebetween.

3,911,634

MODULAR BUILDING SYSTEM

Leonard Horowitz, 30 Joralemon St., Brooklyn, N.Y. 11201, and David Glatman, 375 Parkside Ave., Brooklyn, N.Y. 11226

Filed July 27, 1973, Ser. No. 383,073
Int. Cl. A63h *33/06*
U.S. Cl. 52—79 **4 Claims**



1. A structure formed by interrelated modules derived from a family of five modules which are selectively connectable in end-to-end, side-by-side and in stacked relation, each module being constructed from four face panels selected from a class consisting of square and rhombic panels to create an open-ended geometric form, all sides of said square and rhombic face panels having the same dimension whereby the exposed

edges of all modules have the same dimension and some modules derived from said family may be joined together at their edges and other modules at their congruent faces, said family of modules comprising:

A. a first module composed of a pair of horizontal square panels, joined at their edges to a pair of vertical square panels to define a cubic volume;

B. a second module composed of a pair of vertical rhombic panels having a like-orientation joined at their edges to a pair of horizontal rhombic panels having a like-orientation;

C. a third module composed of a pair of vertical rhombic panels which are reversely-oriented with respect to each other and are joined at their edges to a pair of horizontal rhombic panels, which are reversely-oriented with respect to each other;

D. a fourth module composed of a pair of horizontal rhombic panels havng a like-orientation which are joined at their edges to a pair of vertical square panels; and

E. a fifth module composed of a pair of vertical rhombic panels having a like-orientation whose edges are joined to a pair of horizontal rhombic panels having a reverse-orientation to define one convolution of a helix.

3,911,635
HOLLOW BODY OUTLET FOR UNDER-FLOOR AND UNDER-PLASTER INSTALLATIONS

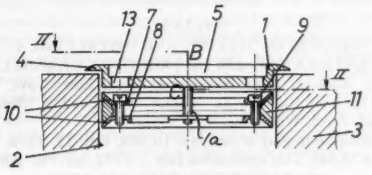
Hans-Martin Traupe, Frinssenstr. 51, 2 Hamburg 55, Germany

Filed Nov. 14, 1973, Ser. No. 415,793

Claims priority, application Germany, Nov. 15, 1972, 419477

Int. Cl.² E04B *5/48*

U.S. Cl. 52—221 **1 Claim**



1. A hollow body for insertion into an outlet opening for under-floor and under-plaster installations formed in hardened material, said hollow body including: a first clamping element and a second clamping element having coaxial central openings, said elements having peripheral inclined surfaces facing each other and converging inwardly toward their axis and adapted to be pressed toward each other, a split tightening element of less diameter than said outlet opening arranged between said first and second clamping elements and having inclined surfaces complementary to and engaging said first inclined surfaces and expandable outwardly of said first and second clamping elements to engage the inner wall of said outlet opening, flanges on the inner peripheries of said elements, and means operatively connected to said flanges on said clamping elements and spaced circumferentially and operable to move said clamping elements toward each other to engage said first inclined surfaces with the inclined surfaces on said tightening element and thereby press said clamping elements to expand said tightening element into frictional engagement with the inner wall of said outlet, and a mounting element on said hollow body to extend across said outlet, inward extensions on the flange of said clamping element farthest from said mounting element, and fasteners connecting said mounting element to said extensions.

3,911,636
DOUBLEWALLED PARTITION WITH INSULATING MATERIAL THEREBETWEEN

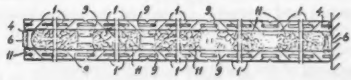
Lars-Inge Bertil Larsson, Lomma, Sweden, assignor to Aktiebolaget Gyproc, Malmo, Sweden

Continuation of Ser. No. 255,294, May 19, 1972, abandoned, which is a continuation of Ser. No. 66,802, Aug. 25, 1970, abandoned. This application Feb. 19, 1974, Ser. No. 443,546

Claims priority, application Sweden, Sept. 10, 1969, 12471/69

Int. Cl.² E04B *2/76*

U.S. Cl. 52—241 **7 Claims**



1. A partition wall structure comprising in combination:

a. a first row comprising a plurality of erect panels that are aligned in edge-to-edge relationship along their vertical sides so as to form the one face of the wall structure,

b. a second row comprising a plurality of erect panels that are aligned in edge-to-edge relationship along their vertical sides so as to form the opposite face of the wall structure,

c. floor runners and ceiling runners that

1. are adapted to be attached to the floor and ceiling respectively of a room,

2. establish the vertical planes in which said first and second rows will be maintained,

3. maintain said first and second rows in a spaced apart essentially parallel relationship,

d. a limited number of vertically extending stud members which

1. are located at widely spaced intervals so as to support only a few of said panels in each of said first and second rows, and

2. further assist in maintaining said first and second rows in spaced apart essentially parallel relationship,

3. the number of such stud members being considerably less than the number of pairs of adjacent panels in each of said first and second rows,

4. said stud members forming together with said floor and ceiling runners the only members of the wall structure bridging the interspace between the two rows of panels,

e. each of said panels in said first and second rows

1. extending approximately from floor to ceiling,

2. having a height greater than its width,

3. having a width which is considerably less than the distance between adjacent stud members,

4. having a side portion that includes a vertically extending surface that is adapted to face the corresponding vertically extending surface of the side portion of the next adjacent panel,

5. having a side portion that also includes a vertically extending groove that is located rearwardly of said vertically extending surface,

6. having an inherent stiffness which is insufficient to avoid deflection tendencies of the panel over a length corresponding to its height, but sufficient to make the deflection tendency of the panel over a length corresponding to its width negligible,

f. a plurality of vertically extending separate rib members, one for each pair of adjacent panels in each of said first and second rows, each of which

1. serves as a vertical stiffener for the related pair of panels in each its separate one of said first or second rows only,

2. has a first vertical portion that is inserted and retained between adjacent panels and extends laterally into the facing vertical grooves that are located in the edges of both adjacent panels,

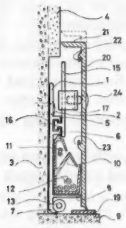
3. has a second vertical portion that extends rearwardly into the space between said first and second rows a distance that is less than the distance between said first and second rows, thereby preventing the occurrence of sound-transmitting bridging of the interspace between said first and second rows, and
4. is entirely independent of said stud members and neither connected to nor supported by any other rib member, and

g. sound absorbing material disposed between said first and second rows of panels, all in such a manner that said first and second rows of panels will form spaced wall elements considerably larger in size than each individual panel therein and mutually connected by sound-transmitting structural members only within a minimum of widely spaced, restricted areas, whereby the sound-insulating capacity of the partition is greatly improved.

3,911,637
BASEBOARD TO RECEIVE ELECTRICAL LINES

Fritz Schmidiger, Loomatt Atrium 4, Stallikon, Zurich, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,695
Int. Cl.² E04F *17/08, 19/04*
U.S. Cl. 52—287 **19 Claims**



1. Baseboard for the receiving of electrical lines, consisting of a cover board and means fastened to a wall for holding said cover board which is detachably connected with the holding means and in this connected position conceals both the holding means and the electrical lines, characterized by the fact that the detachable connection is developed in such a manner that the horizontally arranged cover board (**20**) can be displaced vertically with respect to the holding means (**1, 33**) and fastened in different vertical positions, and wherein said holding means consist of at least one metal support (**1**) which is fastened to a wall and serves simultaneously as mount for a plastic section (**10**) having at least one open duct to receive the electrical lines (**11, 12**), said support (**1**) bears at least one horizontally displaceable slide (**15**) and a clamp (**17**) which is vertically displaceable on said slide and is in engagement with a fastening member (**24**) of the cover board.

3,911,638
VERTICAL CEILING ASSEMBLY AND CLIP ELEMENTS THEREFOR

James A. Englund, Middlesex, and Stephen Popek, Roselle, both of N.J., assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Apr. 22, 1974, Ser. No. 462,625
Int. Cl.² E04B *5/52*
U.S. Cl. 52—489 **13 Claims**

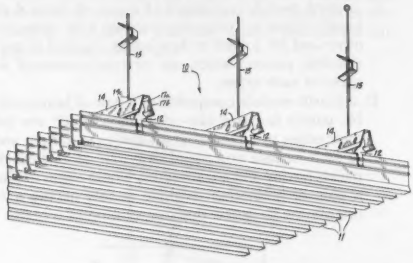
1. A ceiling assembly comprising

a. a plurality of spaced, parallel, elongated stringers each having a plurality of slots provided at spaced intervals along its length;

b. means for suspending said stringers, substantially in a common plane, from superjacent structure;

c. an array of horizontally elongated panels, each having opposed major surfaces oriented vertically, extending in spaced parallel relation to each other beneath and transversely of said stringers; and

d. a plurality of clip elements, each having an upper portion seated in a slot of one of said stringers so as to be held thereby and a lower spring-clip portion grippingly engaging an upper marginal portion of one of said panels, for



suspending said panels from said stringers, each said panel being suspended by plural clip elements respectively seated in plural ones of said stringers;

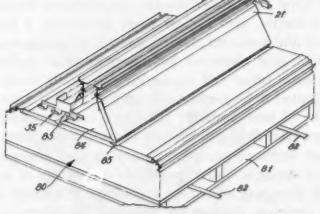
each of said stringers being a downwardly opening channel member having two downwardly diverging legs, said slots being provided in opposed pairs in said legs and extending transversely of the length of said stringers; and

f. the upper portion of each said clip element comprising a pair of opposed tabs respectively inserted in opposed slots formed respectively in the two legs of one of said stringers.

3,911,639
METHOD OF MAKING AND INSTALLING A VENTILLATING AIR DISTRIBUTION CHANNEL

Joel R. Rachlin, 1785 Wedgewood West, Elm Grove, Wis. 53122, and Rudolph O. Neudek, W271N1275 Meadowbrook Road, Waukesha, Wis. 53186

Continuation-in-part of Ser. No. 10,508, Feb. 11, 1970, Pat. No. 3,673,945. This application July 3, 1972, Ser. No. 268,512
Int. Cl.² E04B *5/52*; **F24F** *7/04, 13/06*
U.S. Cl. 52—745 **5 Claims**



1. The method of making and installing an air-distributing duct-channel unit in the assembled supporting grid of spaced rails of a suspended ceiling which method comprises the steps of providing at a factory location a rectangular sheet of fiberglass ducting, providing two channel-forming bars each having conformations on a side thereof defining at least partially enclosed ways and structures for receiving and holding a side edge portion of said ducting, securing at the factory location one of said bars on each side of said ducting to form a unit subassembly, shipping said subassembly to the job location,

forming a duct and attached channel at said job location by bending said ducting to bring said channel-forming bars into channel-forming position, inserting a bracket into said ways at each end of the pair of bars to hold the channel together and thus complete assembly of said air-distributing duct-channel unit, and thereafter installing the duct-channel unit so made in the supporting grid by seating the same upon rails of said grid for support thereby.

3,911,640

METHOD FOR THE PACKING UNDER ASEPTIC CONDITIONS OF STERILE GOODS INTO CONTAINERS

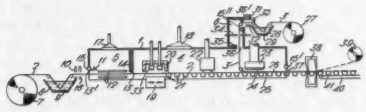
Hans A. Rausing, Lund, Sweden, assignor to Tetra Pak Development SA, Sweden

Filed July 19, 1973, Ser. No. 380,574

Claims priority, application Sweden, Aug. 11, 1972, 10418/72

Int. Cl.² B65B *31/02, 55/18*

U.S. Cl. 53—21 FC **3 Claims**



1. A method for forming, filling and sealing containers under aseptic conditions from a first web of substantially impermeable thermoformable material of indeterminate length comprising moving the first web in the direction of its length with one surface facing a sterile chamber and cooperating therewith to constitute one outer wall thereof by forming a substantial seal therewith, forming a plurality of container elements in the first web, introducing a filler material into the container elements, applying a second web of substantially impermeable thermoformable material to the filled container elements, and sealing the second web to the first web to close and seal the filled container elements, the steps of forming the container elements, filling the container elements and applying and sealing the second web to the filled container elements being carried out while the first web constitutes the one outer wall of the sterile chamber and finally separating the filled and sealed containers after leaving the sterile chamber.

3,911,641

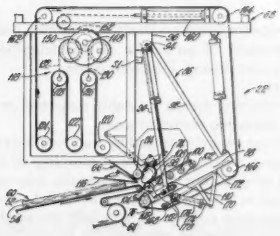
ROLL-UP COMPRESSIVE PACKAGING APPARATUS

Ward B. Miller, Waterville, and Daniel A. McCartan, Forest Hills, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 2, 1973, Ser. No. 412,236

Int. Cl. B65b *63/04, 63/02*

U.S. Cl. 53—21 FW **33 Claims**



28. A method for rolling, compressing, and packaging a flexible, compressible, elongate body, said method comprising moving said elongate body in a path parallel to its longitudinal extent, directing a forward end of said elongate body into a confined zone of generally circular transverse cross section, wrapping the forward end of said elongate body into a spiral while placing pressure on the entire portion of the outer surface of said elongate body which is in said zone except for that portion of the zone where the elongate body enters, and continuing to wrap the body into the spiral configuration while placing pressure sequentially on the portions of the outer surface of said body within said zone at least until the other end of said elongate body enters said zone.

3,911,642

METHOD FOR THE STERILE PACKING OF A STERILE MATERIAL

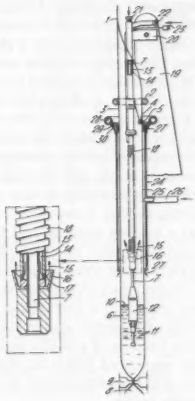
Georg E. Ernstsson, Staffanstorp, and Alfred Fuchs, Lund, both of Sweden, assignors to Tetra Pak International, Sweden

Filed Aug. 27, 1973, Ser. No. 391,556

Claims priority, application Sweden, Sept. 22, 1972, 12225/72

Int. Cl.² B65B *55/06*

U.S. Cl. 53—28 **2 Claims**



1. In a method for sterilizing the inside of a tube of packaging material while being filled with a sterile material in a packaging machine in which a longitudinal web of flexible packaging material is continuously formed into a longitudinal tube, is filled with a sterile material from a filler pipe extending into said tube and is finally formed into separate filled packages by sealing the filled tube transversely at spaced intervals, the improvement comprising heating the inside of the moving tube up to 300°C. by means of a radiant heating element in a zone adjacent the filler tube and above the outlet end thereof, simultaneously introducing a gaseous fluid generally in the direction of tube movement at a temperature of about 200°C. into the inside of the tube above the outlet end of and surrounding the filler pipe, and below the zone of heat radiation and deflecting and reversing the direction of flow of the heated gaseous fluid above the level of sterile filler material to flow upwardly over a greater distance than the zone of heat radiation and in a direction opposite to the movement of the tube past the zone of heat radiation by means of deflector means surrounding the filler tube so as to prevent direct impingement of the heated fluid on the sterile filler material beneath the deflector means while maintaining sterile conditions in the tube during filling of the tube.

3,911,643
CIGARETTE PACKING MACHINE

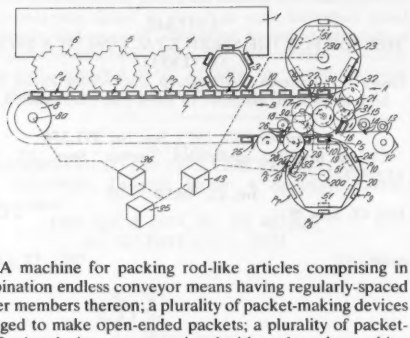
Robert William Davies, London, England, assignor to Molins Limited, London, England

Filed June 4, 1973, Ser. No. 367,054

Claims priority, application United Kingdom, June 8, 1972, 26900/72

Int. Cl.² B65B *19/12, 19/22*

U.S. Cl. 53—170 **12 Claims**



1. A machine for packing rod-like articles comprising in combination endless conveyor means having regularly-spaced carrier members thereon; a plurality of packet-making devices arranged to make open-ended packets; a plurality of packet-transferring devices, one associated with each packet-making device, arranged in succession in spaced positions along a first part of said conveyor means, each packet-transferring device being operable to transfer packets from the associated packet-making device into carrier members on said conveyor means; a plurality of batch handling devices arranged to form batches of rod-like articles and convey said batches for insertion into said packets, each batch-handling device comprising a conveyor member having carrier means for receiving a batch of rod-like articles at a loading position and for conveying said batch from said loading position to an unloading position, said batch-handling devices being arranged in succession in spaced positions along a second part of said conveyor means downstream of said first part; and a plurality of packet-filling devices, one associated with each of said batch-handling devices, operable to transfer batches of rod-like articles from the carrier means of the associated batch-handling device at said unloading position into packets carried in said carrier members of said conveyor means.

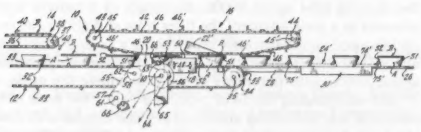
3,911,644
PACKAGE FORMING MACHINE

John H. Myers, Bergenfield, and Edward Waleck, Closter, both of N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Oct. 5, 1973, Ser. No. 403,800

Int. Cl.² B65B *11/10*

U.S. Cl. 53—207 **10 Claims**



1. An apparatus for folding a cut and creased wrapper blank about an article which has the general form of an upwardly facing pan or tray which wrapper blank comprises a central top wall forming panel, end wall forming panels adapted to hinge downwardly along oppositely disposed end wall forming portions of the article, side wall forming panels hinged to the top wall forming panel and extending at each corner thereof adjacent the ends of the end wall forming panels, and corner gusset forming panel members at opposite ends of the hinged connection of said top wall forming and end wall forming panels which gusset forming panel members are creased on angularly related lines for folding of said members on hinge connections with said end and side wall forming panels and to permit portions thereof to collapse upon each other so as to position one of said gusset portions against the adjoining end wall, said apparatus comprising conveyor means for advancing successive articles to a gusset folding station, means for depositing a wrapper blank on each successive article with the end wall panels extending in the plane of the top wall panel and laterally along opposite sides of the path of said article conveyor means, means in the form of vertically extending members mounted at said gusset folding station which have edge portions positioned for engagement by the leading gusset panel members as said gusset panel members are advanced on said conveyor means so as to cause said gusset panel portions to collapse upon each other and in the direction of the trailing gusset panel members and advance on the upper edge portions of said vertically extending members, and means mounted at said station for travel in a vertical plane and in an endless path extending along opposite sides of said conveyor means which is operated in timed relation to the advance of successive article and wrapper blank assemblies and which traverses a portion of said path at a level so as to engage the trailing gusset forming panel members on the trailing faces thereof and collapse said trailing gusset forming panel members in the direction of the leading gusset forming panel members and to position said trailing gusset forming panel members so that they advance onto said upper edge portions of said vertically extending members.

3,911,645
FOLDING DEVICE FOR PACKAGING MATERIAL

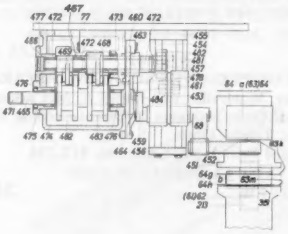
Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Dec. 6, 1973, Ser. No. 422,484

Claims priority, application United Kingdom, Dec. 21, 1972, 59033/72

Int. Cl.² B65B *11/36*

U.S. Cl. 53—234 **2 Claims**



1. A device for folding a sheet of wrapping material around external surfaces of an article of parallelepipedonal shape, said device comprising, in combination:

a support;

article receiving means rotatably mounted on said support to be rotatable about an axis;

cell defining means provided by wall members of said article receiving means to define a plurality of parallelepipedonal shaped cells spaced at angular intervals about said axis and extending in a generally radial direction relative thereto, each cell having a radially outward facing opening each extending substantially perpendicularly to said generally radial direction, and each cell being adapted to receive one said article:

first drive means to rotate said article receiving means stepwise about said axis to cause each said cell to be

arrested successively at a first station where a sheet of wrapping material is introduced into one said cell, a second station where said article is introduced axially into said cell such that said sheet of wrapping material is disposed between said article and walls of said cell in which said article is received, with lobes of said sheet projecting beyond the said opening and in a direction generally radial to said axis, a third station and a fourth station of said device;

guide means disposed at said second station;

carrier means mounted to be reciprocatably displaceable along said guide means;

a folder member rotatably supported on said carrier means; and

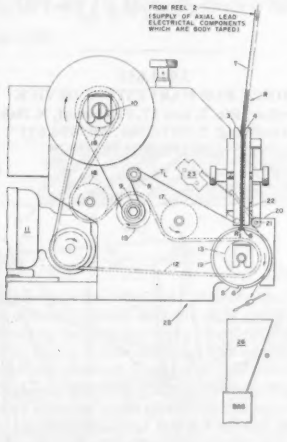
second drive means to displace said folder member between a first position — in which said folder member is radially spaced apart from said opening of said cell at said second station — and a second position — in which said folder member is disposed next adjacent said opening of said cell of said second station — said second drive means, in displacing said folder member from said first position towards said second position, initially imparting rotational motion to said folder member relative to said carrier means and, subsequently to said rotational motion, imparting translational motion to said carrier means, said translational motion being initiated only after said article has been partially introduced axially into said cell and before said article has been completely introduced therein; whereby said folder member is moved along said opening of said cell at said second station to engage one of said radially projecting lobes and to fold said one lobe against the radially outer side face of said article substantially contemporaneously with the introduction of said article into said cell.

3,911,646

FEEDING APPARATUS FOR BODY TAPED COMPONENTS

Joseph F. Larkin, Holland, and Robert J. Singer, Wyncote, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Filed Sept. 11, 1974, Ser. No. 504,921
Int. Cl.² B65B *5/10;* **B23P** *19/00;* **B65D** *7/42*
U.S. Cl. 53—240 **9 Claims**



1. An apparatus for dispensing body taped components comprising:

means for establishing tension on the tape and for moving the tape past a point at which the components are removed from the tape;

means for establishing a counter-force comprising a surface bearing upon at least one of the components sufficient to resist the means establishing tension and for moving the tape in order to prevent movement of the tape;

means for removing a component from the tape;

means for releasing the counter-force comprising means for removing the bearing surface upon removal of a component from the tape in order to permit movement of the tape a predetermined distance;

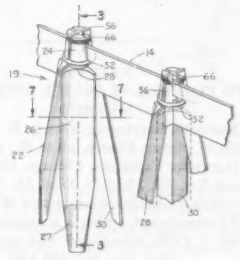
means for re-establishing the counter-force upon movement of the tape the predetermined distance.

3,911,647

POSITIONING ARM FOR CASE LOADER

Thomas P. Hartness, 305 Bridgewater Drive, and Robert G. Hartness, 203 Wilmington Road, both of Greenville, S.C. 29602

Filed Jan. 23, 1974, Ser. No. 435,715
Int. Cl.² B65B *39/02*
U.S. Cl. 53—248 **7 Claims**



1. A positioning arm for use in a grid set on an article loading machine, wherein articles such as bottles are loaded from aligned rows carried above said grid set into a case carried below said grid set, said grid set including a plurality of elongated spaced members being spaced apart sufficiently for allowing said articles to pass therebetween, a plurality of said positioning arms being supported on said elongated spaced members for defining passages through which said articles pass for loading into said case, each of said positioning arms being carried in a respective corner of a passage, resilient means engaging said positioning arms for pivoting a lower end of said positioning arms towards the center of said passages, said positioning arm comprising:

an elongated member having an upper portion, a main body intermediate portion and a lower portion,

said main body portion having an elongated arcuate inner surface for engaging said surface of said articles as said articles pass through said passages for loading into said case, and

a rear side of said upper portion of said elongated member opposite said arcuate inner surface being inclined inwardly defining a pivot point at the junction of said main body portion and said upper portion,

whereby said lower end of said positioning arm can be pivoted towards and away from said center of said passage for guiding said articles therethrough.

3,911,648

SADDLE TREES AND SADDLES

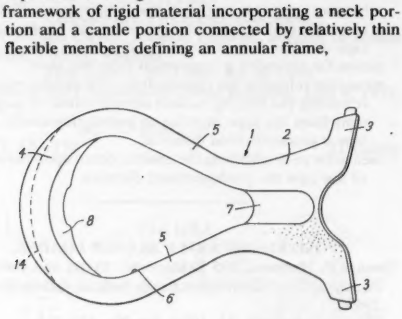
Robert Oscar Lightfoot, Croydon, England, assignor to White Polytechniques Limited, Hounslow, England

Filed Sept. 10, 1973, Ser. No. 395,504
Int. Cl.² B68C *1/00*
U.S. Cl. 54—44 **4 Claims**

1. A saddle tree comprising

a seat portion including

a framework of rigid material incorporating a neck portion and a cantle portion connected by relatively thin flexible members defining an annular frame,



and a major part of said seat portion of resiliently compressible material bonded over said framework and filling said annular frame to a thickness substantially fully from the upper to the lower surfaces of the saddle tree.

3,911,649

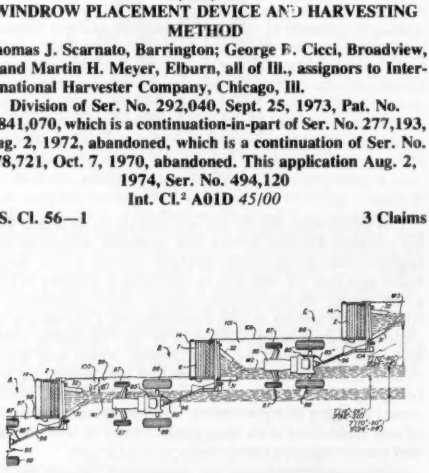
WINDROW PLACEMENT DEVICE AND HARVESTING METHOD

Thomas J. Scarnato, Barrington; George F. Cicci, Broadview, and Martin H. Meyer, Elburn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 292,040, Sept. 25, 1973, Pat. No. 3,841,070, which is a continuation-in-part of Ser. No. 277,193, Aug. 2, 1972, abandoned, which is a continuation of Ser. No. 78,721, Oct. 7, 1970, abandoned. This application Aug. 2, 1974, Ser. No. 494,120

Int. Cl.² A01D *45/00*

U.S. Cl. 56—1 **3 Claims**



1. A harvesting method comprising the successive uninterrupted steps of sweeping a swath of growing crops in a trajectory rearwardly and upwardly toward an elongated cutting zone and toward an elongated conditioning area disposed above and to the rear of the cutting zone, cutting the swath at said cutting zone while the crop is being swept thereinto, and thereupon conveying the cut crops smoothly, continuously, and uniformly to higher elevation while it is maintained off the ground, and at said higher elevation conditioning the crops moving in said trajectory, then projecting the crops in a continuous stream upwardly and rearwardly toward windrow shields, then condensing the stream through said windrow shields at one side of the longitudinal center line of the swath to form one windrow, then remotely relocating said windrow shields to form a windrow at the opposite side of the longitudinal center line, then repeating the operation on an adjacent uncut swath of crop material and condensing the stream through said windrow shields at the opposite side of the longitudinal center line of the adjacent swath to form closely adjacent windrows with a cleared path therebetween.

3,911,650

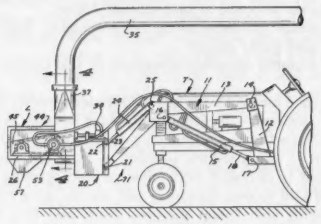
HAY LOADING APPARATUS

Donald F. Johnson, 238 N. Lake Drive, Watertown, S. Dak. 57201

Filed Jan. 2, 1974, Ser. No. 429,874

Int. Cl.² A01D *87/10*

U.S. Cl. 56—13.3 **8 Claims**



5. For being mounted on a high lift assembly of a tractor to be supportingly carried thereby, loader apparatus comprising a framework having a front end portion and a rear end portion longitudinally rearwardly of the front end portion, a flail housing mounted on the framework and having a front inlet opening and a rear discharge opening longitudinally rearwardly of the front opening, a blower mounted on the framework and having an inlet opening directly to the housing discharge opening to receive material from the housing, a flail shaft mounted in the housing for rotation about a transverse axis, a plurality of flails, and means for mounting the flails in angular and transverse spaced relationship on the shaft to rotate therewith, said housing having a top wall that has a front edge that is at a higher elevation than said axis and a substantial distance rearwardly of the forward-most part of the path of movement of the flails and forwardly of said axis, vertical side walls that in part define said front opening, said side walls having generally vertical front terminal edges located a substantial distance rearwardly of the forwardmost part of the path of movement of the flails as the shaft is rotating, and a bottom wall extending between the side walls, said bottom wall having a front terminal transverse edge longitudinally between the forwardmost and rearward-most part of the path of movement of flails when the shaft is rotating and and at a lower elevation than said axis.

3,911,651

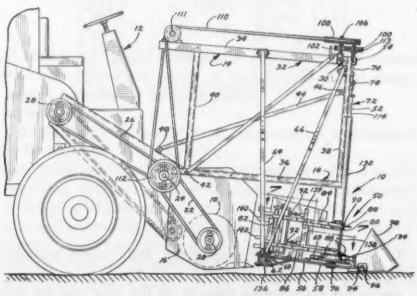
ROW CROP HARVESTING DEVICE

Alvin J. Schreiber, Rte. 2, Box 57, Fairmount, N. Dak. 58030

Filed Aug. 5, 1974, Ser. No. 494,632

Int. Cl.² A01D *45/02*

U.S. Cl. 56—98 **17 Claims**



1. A row crop harvesting device for attachment to a pro-

pelled machine having a forwardly facing intake scoop, said harvesting device including:

A. a harvester suspension frame integrally supported on said machine and extending forwardly of the intake scoop to position at a considerable distance above at least one row to be harvested;

B. a cutterhead unit for each row to be harvested, said unit being suspended from the harvester suspension frame for limited movement in a vertical plane transverse to the longitudinal dimension of the row and said unit including:

1. a cutter unit pivot rod pivotally supported from upper portions of said suspension frame, to be in adjacent, closely spaced relation to the row,

2. a cutterhead frame pivotally mounted to said pivot rod for movement in a vertical plane aligned with the longitudinal dimension of the row extending forwardly from the pivot rod,

3. ground engaging means associated with forward portions of said cutterhead frame,

4. a pair of overlapping circular cutters rotatably mounted in said cutterhead frame to be in fixed vertical relation to the row to be cut pursuant to the operation of said ground engaging means, and

5. means for causing said cutters to rotate in opposite directions with respect to each other to sever row crop plants from the rows as said machine is propelled along said row;

C. a plant stalk feed assembly including:

1. a plant stalk feed drum concentrically mounted above each of the circular cutters,

2. a plant stalk roller rotatably mounted with respect to said cutterhead frame in parallel spaced relation behind each feed drum,

3. plant stalk conveyor belts operably mounted on each pair of drums and rollers and having stalk conveying fingers extending outwardly therefrom, and

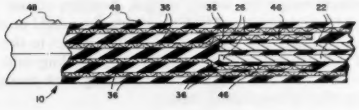
4. means for rotating said feed assembly to cause said fingers to move severed stalks from above said cutters rearwardly for delivery over and into said scoop.

3,911,652

SAFETY BLADE FOR ROTARY LAWN MOWERS

Elmer R. Houle, 2221 N. 40th St., Phoenix, Ariz. 85008

Filed Jan. 11, 1974, Ser. No. 432,663
Int. Cl.² A01D *55/18*
U.S. Cl. 56—295 **9 Claims**



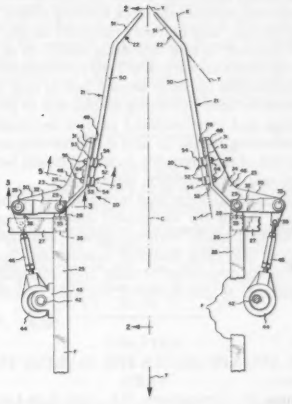
1. In a safety blade for rotary lawn mowers, the combination of: a blade assembly having opposite ends and a middle portion; said middle portion having a shaft receiving opening adapted to be disposed over and fixed to a motor driven shaft on a substantially vertical rotary axis; said blade assembly having a corresponding rotary axis and blade assembly comprising at least one rigid metal layer; fabric layers; and resilient rubber-like layers of material bonded to and securing said fabric layers and said metal layer together; said metal layer being encapsulated between said fabric layers and said layers of rubber-like material; said metal layer having opposite ends terminating in spaced relation to said opposite ends of said blade assembly and corresponding opposite ends of said fabric and rubberlike layers.

3,911,653

MACHINE FOR HARVESTING FRUIT GROWN ON PLANTS ARRANGED IN A ROW

Charles G. Burton, Lewiston, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 242,716, April 10, 1972. This application Apr. 25, 1974, Ser. No. 463,965
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **17 Claims**



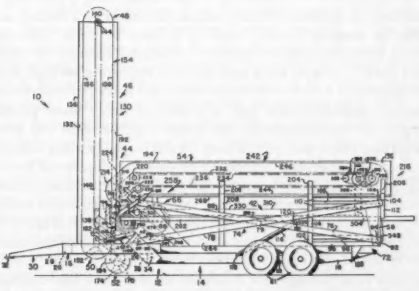
1. In a machine for harvesting produce grown on plants arranged in a row and having a frame movable forwardly along said row, produce picking means arranged on said frame for movement back and forth transversely of said row including constantly rearwardly extending arm bar means engageable with the plants and mens for moving said arm bar means back and forth transversely of the row, wherein the improvement comprises finger means on the trailing end of said arm bar means and extending laterally therefrom.

3,911,654

MACHINE FOR FORMING A COMPACT STACK OF CROP MATERIAL

David L. Darnall, Fresno; Gene R. Butler; Lee D. Butler, both of Kingsburg, and Lester C. Barton, Fresno, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 5, 1974, Ser. No. 458,270
Int. Cl.² A01D *89/00*
U.S. Cl. 56—350 **4 Claims**



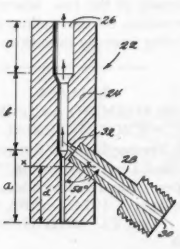
1. In a machine for forming a stack of crop material, such as a compact stack of hay or the like, the combination comprising:

a mobile chassis adapted to move across a field;
means mounted upon said chassis for forming crop material into a stack, such as a compact stack of said crop material;
means mounted upon said chassis adjacent said stack forming means for continuously delivering crop material from the field to above said stack forming means and from adjacent a first end of said stack forming means toward an opposite end thereof;
means mounted upon said chassis for movement above and between said ends of said stack forming means and having a terminal end, said movably mounted means being positioned adjacent to said delivering means so as to support said crop material being delivered from adjacent said first end toward said opposite second end of said stack forming means by said delivering means and to progressively discharge said crop material past its terminal end from said delivering means to said stack forming means upon movement of said movably mounted means between said ends of said stack forming means; and
means mounted adjacent said terminal end of said movably mounted means for movement therewith between said ends of said stack forming means and operable for spreading said crop material across said stack forming means upon discharge of said crop material past said terminal end of said movably mounted means.

3,911,655
PROCESS AND APPARATUS FOR MAKING TEXTURED YARN

Joe F. London, Jr., Greensboro, N.C., and Jean-Louis Lauber, Munchenstein, Switzerland, assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 217,059, Jan. 11, 1972, abandoned. This application Dec. 5, 1973, Ser. No. 421,850
Int. Cl.² D02G *1/20, 3/34*
U.S. Cl. 57—34 HS **7 Claims**

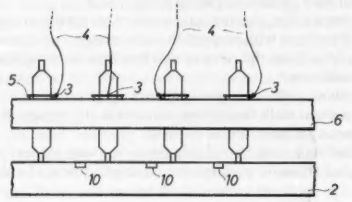


5. Apparatus for preparing a yarn comprising a plurality of continuous synthetic thermoplastic filaments of a denier suitable for making fabrics, such as wovens or knits, said yarn being characterized by uniform repeating sections of about ⅛–1 inch in length, each said uniform repeating section being composed of a relatively open bulky and lofty portion of false twisted multifilaments and a relatively short node portion where the multifilaments are closer together and are interlaced and encircled, comprising means for supporting a supply of at least one end of multifilament yarn to be textured, texturing means including heating means and false twisting means, means for continuously passing said yarn through said texturing means whereby said yarn is false twisted and heat set in the twisted condition, an air jet device having a cylindrical chamber of about one-eighth inch diameter formed therein, a coaxial yarn feed passage of a diameter smaller than said chamber leading into said chamber and an air inlet of a cross-section smaller than that of said chamber having an axis which converges with respect to the axis of the chamber in the direction of yarn movement and intersects therewith at an angle of between 45°–75° measured between said inlet and said passage, means for continuously withdrawing the yarn from said texturing means and continuously feeding the same through said yarn inlet and said chamber with an overfeed of from 2–10 percent and means for communicating a source of air under a pressure of between 15–30 psig with said air inlet.

3,911,656
DEVICE FOR SURVEYING THREAD BREAKAGE, ESPECIALLY FOR AUTOMATIC CONNECTING DEVICES IN SPINNING MACHINES

Louis Vignon, Geneva, Switzerland, assignor to Heberlien Hispano SA, Vernier-Geneva, Switzerland

Filed Jan. 4, 1974, Ser. No. 430,797
Claims priority, application Switzerland, Jan. 4, 1973, 58/73
Int. Cl.² D01H *13/16, 15/00*
U.S. Cl. 57—34 R **7 Claims**



1. For surveying thread breakage in a spinning machine having a plurality of spinning stations each having a rotatable traveller the rotation of which is interrupted upon thread breakage, carriage means for cyclically moving along the individual spinning stations; signal responsive stop means for stopping said carriage; activatable electromagnetic sensor means carried by said carriage for, when activated, electromagnetically surveying traveller rotation sequentially at each station and passing a stop signal to said stop means upon detection of thread breakage as electromagnetically sensed from the condition of a traveller; switch means for activating said electromagnetic sensor means; position sensor means carried by said carriage for determining the actual position of said electromagnetic sensor means with respect to the traveller of each spinning station and for controlling said switch means to activate said thread sensor during each passage past the traveller of a spinning station.

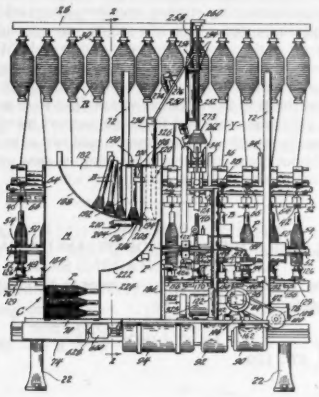
3,911,657
TEXTILE MACHINE

Charles C. Bell, Warwick, R.I., and Kurt W. Niederer, Charlotte, N.C., assignors to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 847,011, Aug. 4, 1969, abandoned, which is a division of Ser. No. 728,637, May 13, 1968, Pat. No. 3,559,915, which is a division of Ser. No. 534,081, March 14, 1966, Pat. No. 3,403,866. This application Mar. 16, 1972, Ser. No. 235,449
Int. Cl.² D01H *15/00*
U.S. Cl. 57—34 R **119 Claims**

1. A method of threading a ring traveller of a textile machine comprising the steps of wrapping said strand at least partially around the periphery of a ring on which said traveller

is mounted, positioning a contiguous portion of the strand in a path contacting a traveller engaging portion of the ring, and



propelling said traveller around at least a portion of said ring to cause said traveller to ride over and engage said strand.

3,911,658

METHOD OF AND APPARATUS FOR THE PIECING UP OF YARNS

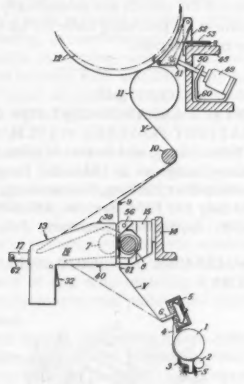
Alan Smith, Accrington, England, assignor to Platt International Limited, England

Filed Dec. 12, 1973, Ser. No. 423,897

Claims priority, application United Kingdom, Dec. 14, 1972, 57837/72

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34 R **25 Claims**



1. A method of piecing-up yarn for an open-end spinning machine of the kind referred to comprising forming the yarn into an extended first yarn path and into an extended second yarn path to provide first and second reserve lengths of yarn respectively, and then, releasing the first and second reserve lengths of yarn, with the delivery of yarn halted to enable the first reserve length of yarn to enter the open-end spinning means and to enable the second reserve length of yarn to be taken-up by the take-up means and making operative the yarn delivery means to commence or re-commence the formation, delivery and take-up of yarn.

10. Apparatus for piecing up an open-end spinning machine of the type in which yarn is formed in an open-end spinning means and travels in a first path to yarn delivery means and in a second path from the yarn delivery means to yarn take-up means, the apparatus comprising:

a first yarn reserve length holding means which hold the yarn in an extended first yarn path to form a first reserve of yarn, a second yarn reserve length holding means which hold the yarn in an extended second yarn path to form a second reserve of yarn, and

control means which, with the delivery of yarn halted, control the release of the yarn from the first yarn reserve length holding means whereby the first reserve of yarn enters the open-end spinning means, and control the release of the yarn from the second yarn reserve length holding means to enable the second reserve of yarn to be taken up by the take-up means and which operate the yarn delivery means to commence the formation, delivery and take-up of yarn.

3,911,659

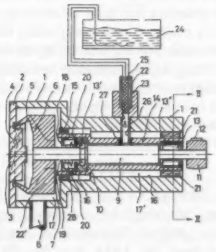
BEARING ARRANGEMENT FOR A SPINNING ROTOR OF AN OPEN END SPINNING DEVICE

Gerhard Mandl, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Continuation-in-part of Ser. No. 383,722, July 30, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 459,199

Int. Cl.² D01H *1/12, 7/04*

U.S. Cl. 57—58.89 **13 Claims**



1. A bearing arrangement for a spinning rotor of an open end spinning device, comprising a rotor housing, a spinning rotor incorporating a shaft having opposed ends, said shaft being arranged in said rotor housing, a turbine mounted at one end of the shaft, a drive whorl mounted at the other end of said shaft, antifriction bearings for supporting said shaft, a sleeve surrounding said shaft for rigidly mounting the antifriction bearings thereat, said rotor housing have a bore bonded by a wall, an elastic member surrounding said sleeve and connecting said sleeve with the wall of said bore, said sleeve being constituted by a thin-walled light and rigid metallic sleeve, said elastic member comprising a ring of elastomeric material placed upon the end of the thin-walled light metallic sleeve confronting the turbine, said sleeve being spaced from the wall of said bore to define a compartment therebetween, said ring sealing said compartment between said sleeve and the wall of said bore in the housing, and means provided between said ring which seals said compartment and said drive whorl for permitting the penetration of air into said compartment.

3,911,660
OPEN-END SPINNING MACHINE

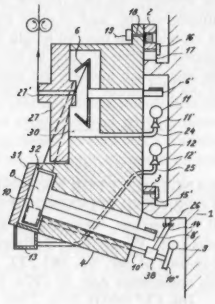
Herbert Stalder, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Sept. 3, 1974, Ser. No. 502,909

Claims priority, application Switzerland, Oct. 19, 1973, 14792/73

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **7 Claims**



1. An open-end spinning machine equipped with a plurality of adjacently arranged exchangeable spinning units, each of which spinning units comprises a spinning rotor, an opening device for individual fibers and a feed mechanism, and the mechanical drive elements of which are detached from drive elements of the spinning machine by shifting the spinning unit from its operating position to a completely detached position, the improvement comprising a holding device for each spinning unit for locking such associated spinning unit in its operating position, said holding device being equipped with means for lowering the spinning unit upon carrying out an unlocking operation for detaching the drive elements.

3,911,661
YARN FRICTION FALSE TWIST DEVICE

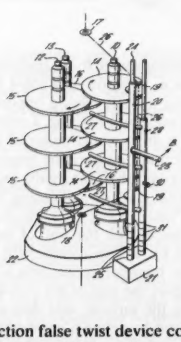
Geoffrey Naylor, Macclesfield, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Sept. 18, 1974, Ser. No. 507,299

Claims priority, application United Kingdom, Sept. 19, 1973, 43885/73

Int. Cl.² D01H *7/92*; D02G *1/04*

U.S. Cl. 57—77.4 **4 Claims**



1. In a strand friction false twist device comprising a plurality of rotary overlapping friction discs arranged in sets, a plurality of parallel equiangularly spaced shafts each mounting a respective set of discs to be rotated by the shafts all in the same direction of rotation, the discs being axially spaced on the shafts and from each other and overlapped to provide a zig-zag spiralling path for a strand running through the centre of the device and over the rims of the friction discs, the improvement which consists of providing a threading up mechanism comprising support members about which can be releasably supported a loop of running yarn extending about the exterior of the sets of discs from end to end of the device, guide arms, means mounting and positioning said guide arms for them to extend towards the centre of the device and between the shafts of two adjacent sets of discs so as to guide the loop of yarn when released from the support members laterally inwardly into the device between said two adjacent sets of discs without contacting that set having its rims moving outwardly relative to the centre of the device.

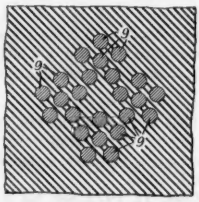
3,911,662
STEEL TIRE CORDS, METHOD OF MAKING SAME AND ARTICLES CONTAINING SAME

James M. Fenner, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Filed Jan. 22, 1973, Ser. No. 325,262

Int. Cl.² D02G *3/42*

U.S. Cl. 57—149 **12 Claims**



1. A cord comprising a plurality of strands of steel wires twisted together, and having axially extending interstices opening radially between the wires of each of the strands, and in which the wires of the strands are substantially free of twist but have a permanent set providing force for locking together the twisted strands of the cord.

3,911,663
CONTACT ARRANGEMENT FOR A BATTERY-POWERED WATCH

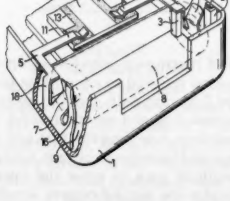
Eckhard Kern, Schramberg, and Robert Wolber, Lauterbach, both of Germany, assignors to Gebruder Junghans Gesellschaft mit beschrankter Haftung, Schramberg, Germany

Filed July 11, 1974, Ser. No. 487,628

Claims priority, application Germany, July 24, 1973, 7327047[U]

Int. Cl.² G04C *3/00*; G04B *19/30*

U.S. Cl. 58—23 BA **13 Claims**



1. A contact arrangement for a battery-powered watch having a housing formed of electrically insulative material, a battery, and a conductor plate; said conductor plate having a plurality of electric conductor paths; said contact arrangement comprising:

a plurality of conducting rails, each conducting rail including a first contact tongue and a second contact tongue formed of electrically conductive material;

each conducting rail being mounted to said housing such that said first contact tongue contacts a pole of said battery and said second contact tongue contacts one of said conductor paths;

the configuration of said conducting rails being such that, with the conducting rails being assembled to said housing, said second contact tongues are displaced from their rest position into spring biased engagement with said conductor paths.

3,911,664

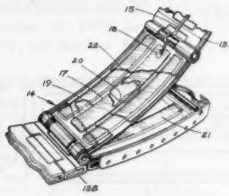
WRIST ACTUATED PRESSURE SWITCH FOR WATCHES

Terry M. Haber, 3050 S. Bristol, No. 8C, Santa Ana, Calif. 92707

Continuation-in-part of Ser. No. 516,688, Oct. 21, 1974. This application Mar. 7, 1975, Ser. No. 556,335

Int. Cl.² G04C *3/00*; **G04B** *19/30*

U.S. Cl. 58—23 R **9 Claims**



1. In a wristwatch comprising a watch casing and band for encircling a wearer's wrist, the casing having a display on its face requiring that a circuit be momentarily closed to render the display visible and wherein said circuit includes an internal lead which is closed by electrically connecting the lead to the said casing, a wrist actuated pressure switch for closing said circuit including, in combination:

a. a flexible conducting strip located on said band in a position between 120° and 240° from said casing;

b. a thin sheet of insulating material underlying said strip and having an open window exposing a surface portion of said strip;

c. a conducting plate underlying said insulating material and window so that said insulating material and window are sandwiched between said strip and plate, the thickness of said insulating material and size of said window being such that a given pressure against said strip will cause a portion of the strip overlying the window to flex through the window and electrically contact said plate, the natural resiliency of said strip returning it to an out-of-contact position relative to said plate in the absence of said pressure; and,

d. first and second conducting means connecting said strip and plate respectively to said internal lead and watch casing so that said circuit is closed when said given pressure is applied to said strip.

3,911,665

ELECTRONIC TIMEPIECE HAVING COMPLEMENTARY ELECTRO-OPTICAL AND ELECTRO-MECHANICAL DISPLAYS

Petrus A. van Berkum, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 4, 1974, Ser. No. 432,935

Int. Cl.² G04B *19/30*; **G09D** *3/00*; **G04B** *19/24*

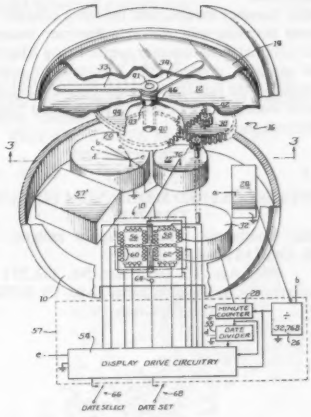
U.S. Cl. 58—50 R **2 Claims**

1. A compact electronic watch capable of displaying multiple time-related functions at relatively low levels of power consumption, comprising within a housing;

a first electrical storage battery having a relatively large physical size and storage capacity connected in series to a second electrical storage battery having a relatively small physical size and storage capacity;

pulse-drivable electro-mechanical time display means for displaying the hours and minutes of the day;

normally-off electro-optical display means coupled across said first and second batteries in series for displaying at least one additional time-related function having a lower normal use factor than hours and minutes; and



control means coupled across said first battery only and including pulse generating means for generating a train of highly regular electrical pulses for supply to said electro-mechanical display means to drive said electro-mechanical display means in order that hours and minutes, the most-used time functions, are displayed continuously for the convenience of the user,

said control means developing a control signal for activating said electro-optical display means which displays the less-used additional time function only on command whereby to conserve stored energy in the battery means.

3,911,666

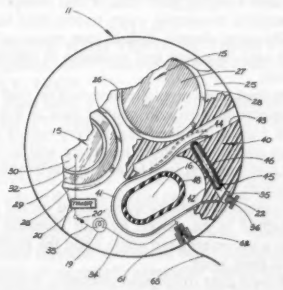
ACTUATING MECHANISMS FOR WRIST INSTRUMENTS

Terry M. Haber, 3050 S. Bristol, Apt. 8-C, Santa Ana, Calif. 92707

Filed Oct. 21, 1974, Ser. No. 516,688

Int. Cl.² G04B *19/30*, *19/34*

U.S. Cl. 58—50 R **3 Claims**



1. In a timepiece adapted to be worn on the wrist and including a power source having first and second electrical

terminals, a display, means for illuminating said display, and actuating means for connecting said power source to the illuminating means to energize same, the improvement wherein said actuating means comprises:

inertia actuated switch means including a movable contact; spring said movable contact being designed and mounted to be biased out of contact with said first terminal, said illuminating means being connected between said movable contact and said second terminal so that engagement of said first terminal by said movable contact completes a circuit from said power source through said illuminating means; and

movable hammer means, said movable contact being positioned between said movable hammer means and said first terminal, said hammer means being adapted to move said movable contact into engagement with said first terminal in the presence of a deliberate rapid acceleration and/or deceleration of said wrist having a predetermined minimum magnitude.

3,911,667

INSTANTANEOUS FEED MECHANISM FOR A DAY-DATE TIMEPIECE

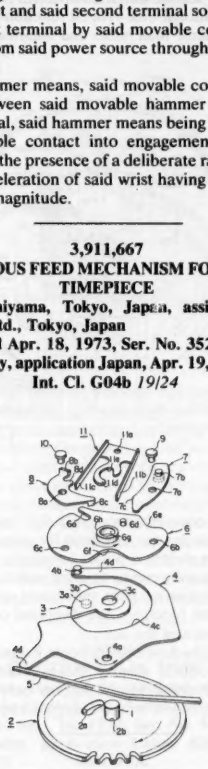
Katsuhiko Komiyama, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1973, Ser. No. 352,271

Claims priority, application Japan, Apr. 19, 1972, 47-45656

Int. Cl. G04b *19/24*

U.S. Cl. 58—58 **4 Claims**



1. In a calendar timepiece having a pillar plate, a time keeping gear train, a data calendar, a day calendar, and a day calendar quick correction means, an instantaneous calendar feed mechanism comprising the combination of:

a date gear rotatably mounted on said pillar plate and driven by the time-keeping gear train of said timepiece to make one complete revolution every twenty-four hours;

a generally spiral shaped control cam mounted concentrically to said date gear and rotatable in unison with said date gear;

a calendar feed lever pivotally mounted on said pillar plate for cooperation with said control cam to rotate quickly through a predetermined angle every twenty-four hours; a spring attached to the pillar plate and connected for biasing said calendar feed lever towards its cam-cooperating position;

an intermediate disc pivotably mounted on the pillar plate and adapted to be driven by said calendar feed lever through a predetermined angle upon the rotation of said calendar feed lever;

a spring-biased date drive pawl pivotably mounted on said intermediate disc and operatively connected to said disc to move quickly upon the angular movement of said disc and thereby advance said date calendar one unit;

a spring-biased day drive pawl pivotably mounted on said intermediate disc and operatively connected to said disc to move quickly upon the angular movement of said disc and thereby advance said day calendar one unit; and

a calendar over feed prevention means comprising respectively a first and a second spring arm mounted on said pillar plate and connected with said first and second spring arms opposing the rotational inertia of both said date and day calendars by pressure contact against said date drive pawl and said day drive pawl, respectively, upon completion of the instantaneous feed of both said calendars, said second spring arm adapted to permit a resilient escapement movement upon receiving a quick correction reverse movement from said day calendar quick correction means.

3,911,668

WATCH HAVING ONE HAND

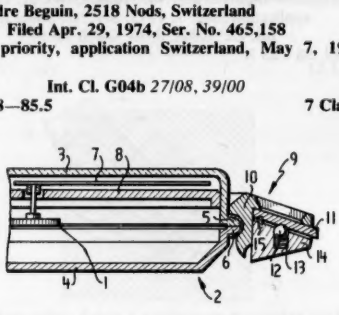
Pierre-Andre Beguin, 2518 Nods, Switzerland

Filed Apr. 29, 1974, Ser. No. 465,158

Claims priority, application Switzerland, May 7, 1973, 6769/73

Int. Cl. G04b *27/08, 39/00*

U.S. Cl. 58—85.5 **7 Claims**



1. A watch comprising:

a watch case including a watch crystal;

a hand means mounted within said case and visible through said crystal for indicating time;

a watch movement means mounted within said case for moving said hand means;

a bezel for supporting said case, said bezel including a mounting means for engaging said case but for allowing said case to be rotated relative to said bezel and an indicia means for displaying graduated indicia around said case and thereby indicating time by its positional relationship to said hand means.

3,911,669

WATCH CONSTRUCTION

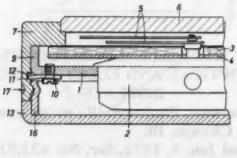
Hermann Burkle, Schwann, Germany, assignor to Kienhöfer & Moog GmbH KG., Germany

Filed Apr. 3, 1974, Ser. No. 457,628

Claims priority, application Germany, Apr. 4, 1973, 2316784

Int. Cl.² G04B *37/00, 37/04*

U.S. Cl. 58—88 C **9 Claims**



1. A watch construction which includes: a watch housing having an upper housing section and a lower housing section,

connecting means connecting said housing sections together, said upper section having an inner surface facing said lower section, a watchwork arranged within said housing, a holding ring supporting said watchwork, a dial plate mounted on said watchwork, spacer means associated with the radially outer portion of said holding ring and spacing said holding ring from said inner surface, at least a portion of said spacer means being located radially outwardly of said dial plate, and holding means holding said holding ring in a substantially constant position relative to said inner surface of said upper section, said spacer means being formed by upwardly directed marginal flange means of said holding ring, said flange means engaging said inner surface of said upper section, and said holding means including resilient means fastened to said holding means, said upper housing section comprising a skirt section surrounding said holding ring and having a recess engaged by said resilient means.

3,911,670

WATCH-CASE ASSEMBLY RESISTANT TO THERMAL SHOCK

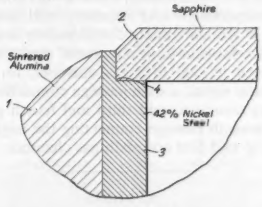
Eric Michel Hofer, Le Locle, Switzerland, assignor to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Filed Jan. 16, 1975, Ser. No. 541,578

Claims priority, application Switzerland, Jan. 18, 1974, 673/74

Int. Cl.² G04B *37/00, 43/00*

U.S. Cl. 58—88 C **10 Claims**



1. A watch-case assembly comprising:
a cap of hard material;
a crystal of hard material secured in said cap; and
a metallic watch-movement casing secured to said crystal and cap, said crystal, said cap, and said casing having substantially the same coefficient of thermal-expansion.

3,911,671

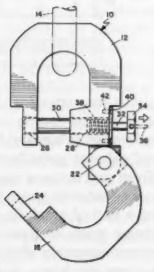
SNAP LINK

Rafael Guillen, 2171 Rising Glen Way, San Diego, Calif. 92139

Filed Feb. 12, 1975, Ser. No. 549,160

Int. Cl.² F16G *15/04*

U.S. Cl. 59—89 **6 Claims**



1. A releasible connecting link comprising:
a. a first half-link having two extended ends, each of the ends having a bore therethrough such that the bores are mutually aligned;
b. a pin sideably mounted in one of said bores and extending across said half link into the other of said bores;
c. a second half-link pivoted to the end of said link having said pin mounted therein and having a third bore in the free end thereof, said second link being pivotable into a closed position such that the bore therein falls into alignment with said aligned bores whereby said pin may be slideably displaced to engage the third bore to define two connected halves of a single link.

3,911,672

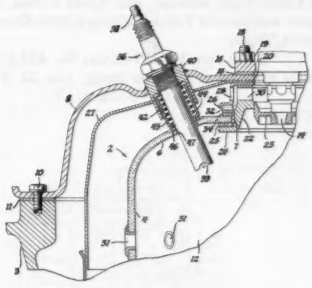
COMBUSTOR WITH CERAMIC LINER

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1974, Ser. No. 458,073

Int. Cl.² F02C *7/20*

U.S. Cl. 60—39.32 **5 Claims**



1. A combustion apparatus for a gas turbine engine including a support; a combustion liner of ceramic material, the liner having a side wall and a converging wall portion at the upstream end of the side wall surrounding an opening at the upstream end of the liner; abutment means extending from the support through the said opening and bearing against the inner side of the liner wall portion around the opening; and resiliently-biased means reacting against the support and bearing against the outer side of the liner wall portion around the opening to press the liner against the abutment means and support the liner with freedom for relative expansion of the liner and the liner supporting means including the abutment means and the resiliently-biased means.

3,911,673

V.T.O.L. ENGINE WITH VERTICAL THRUST CONTROL

Richard Roginson, 4194 Tonawanda Creek Road, North Tonawanda, N.Y. 14120

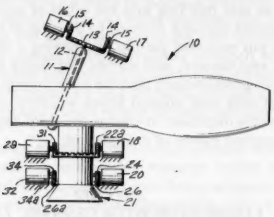
Filed Mar. 11, 1974, Ser. No. 450,180

Int. Cl.² F02K *1/00, 1/20;* **B64C** *29/00*

U.S. Cl. 60—229 **2 Claims**

1. In a jet engine which comprises a nozzle including a passage therein for exhaust gases; a gate valve carried by said nozzle and adapted to close said passage; a tubular base portion connected to said nozzle forwardly of said gate valve and communicating with said passage; said base portion having a collar mounted thereon; said collar being rotatable and carrying a plurality of angularly adjustable vanes for selectively deflecting exhaust gases passing through said base portion; means operatively connected to said gate valve for opening and closing the same; means operatively connected to said collar for rotating the same; and means operatively connected

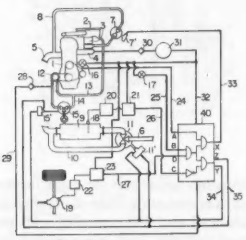
to said vanes for adjusting the angle thereof, said means, in each instance, comprising both an electric motor and a compressed air motor, a separate electric motor and a separate compressed air motor being provided for each of said means.



3,911,674
CONTROL APPARATUS FOR ENGINE EXHAUST GAS PURIFICATION SYSTEM

Kenji Goto; Norio Shibata, and Ryozo Mitsui, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 15, 1974, Ser. No. 433,478
Claims priority, application Japan, Jan. 22, 1973, 48-8730
Int. Cl.² F02B 75/10
U.S. Cl. 60—278 **8 Claims**



1. Control apparatus for a fluid cooled engine of a vehicle including an exhaust gas purification system having an exhaust gas recirculation system including a negative pressure source, an exhaust gas oxidation reactor, and a secondary air supply system including a positive pressure source, comprising:

a. first means for detecting the temperature of engine cooling fluid and providing a first pneumatic signal when the fluid temperature exceeds a predetermined level;

b. second means for detecting ambient temperature and providing a second pneumatic signal when the ambient temperature exceeds a predetermined level;

c. third means for detecting the internal temperature of the gas oxidation reactor and providing a third pneumatic signal when the internal temperature exceeds a predetermined level;

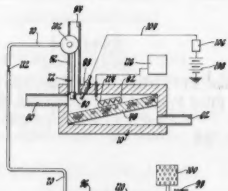
d. fourth means for detecting the speed of the vehicle and providing a fourth pneumatic signal when the vehicle speed is lower than a predetermined speed; and

e. selective actuating means for logically processing said first, second, third and fourth pneumatic signals to produce fifth, sixth and seventh pneumatic signals which control the exhaust gas recirculation system, the exhaust gas oxidation reactor and the secondary air supply system, said selective actuating means including a first inlet having a first one-way valve for receiving said second pneumatic signal, a second inlet including a second one-way valve for receiving said fourth pneumatic signal, said first and second valves being closed in response to the pressure of said second and fourth pneumatic signals, a first passage connecting said first and second inlets via said first and second valves, a third inlet including a third one-way valve for receiving said first pneumatic signal, a second passage including a fourth one-way valve connected to said third inlet via said third valve and to said first passage via said fourth valve, said fourth valve allowing gas to flow only from said second passage to said first passage, said second passage including a first outlet for said fifth pneumatic signal, a third passage having a pair of orifices and connecting said first and second passages, a gas vent formed in said third passage, a first three-way change-over valve including a first diaphragm and first and second compartments located on either side of said first diaphragm, said second compartment communicating with said first passage, a first valve member, connected to said first diaphragm, for changing communication between first, second and third gas chambers, a first spring, connected within said first compartment, for applying a spring force to said first diaphragm, a second three-way change-over valve including a second diaphragm and third and fourth compartments located on either side of said second diaphragm, a second valve member, connected to said second diaphragm, for changing communication between fourth, fifth and sixth gas chambers, a second spring, connected within said fourth compartment, for applying a spring force to said second diaphragm, a fourth passage connecting said second and third compartments, a fifth passage connecting said first and fourth compartments, a fourth inlet connected to said first compartment and receiving said third pneumatic signal, a second outlet, connected to said second gas chamber, for said sixth pneumatic signal, a third outlet, connected to said fifth gas chamber, for said seventh pneumatic signal, a sixth passage connecting the positive pressure source to said third and fourth gas chambers, and a seventh passage connecting the negative pressure source to said first and sixth gas chamber.

3,911,675
KEEP-HOT CATALYTIC CONVERTER

James R. Mondt, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1974, Ser. No. 454,245
Int. Cl.² F01N 3/14
U.S. Cl. 60—283 **2 Claims**



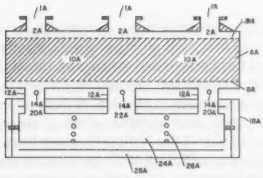
1. A heated catalytic converter for use in a motor vehicle having an internal combustion engine comprising: a converter housing defining an interior space and having an inlet and an outlet for the flow of exhaust gases from the engine into said interior space and from said interior space to the atmosphere; separation means in said interior space between said inlet and said outlet including a bed of catalytic material supported so as to cause the exhaust gases to pass through said catalytic material; a pilot burner assembly attached to said converter housing having an open discharge end communicated with said interior space upstream from said converter bed; said pilot burner assembly including nozzle means therein fluidly

connected to the upper portion of the vehicle fuel tank by a fuel-air line to pass a fuel-air mixture thereto for subsequent flow through said nozzle into said interior space of the converter; said nozzle means including an enlarged open-ended portion communicated with said interior space of the converter and fluidly connected to said fuel-air line by an orifice which controls the flow of the fuel-air mixture entering said interior space and increases its velocity; said pilot burner assembly also including an open-ended nozzle housing encircling said enlarged open-ended portion to define an annular passage therebetween communicated with said interior space for the passage of supplemental air into said interior space; a plurality of small openings in said enlarged open-ended portion encircling said fuel-air orifice, extending from the interior of said nozzle housing to the interiors of said enlarged open-ended portion and said converter for introducing a secondary supply of air to said interior space; the interior of said nozzle housing being fluidly connected to a source of pressurized air for introduction into the interior of said converter through said secondary air openings and said annular passage; pump means including said source of secondary air for passing the fuel-air mixture and the secondary and supplemental air into the interior of said converter through said pilot burner assembly; a spark-producing member for igniting said fuel-air mixture within said interior space upstream from said catalytic bed.

3,911,676
EXHAUST SYSTEM

Knud Jensen, 16, Hvidager, 2620 Albertslund, Denmark

Continuation-in-part of Ser. No. 189,860, Oct. 18, 1971. This application Nov. 3, 1972, Ser. No. 303,542
Int. Cl.² F01N *3/14*
U.S. Cl. 60—301 **36 Claims**

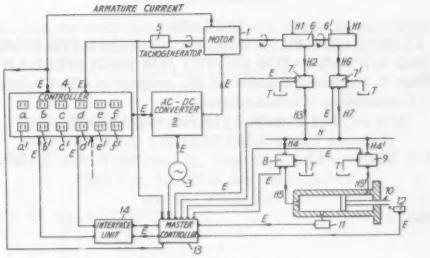


1. A unitary exhaust conditioning apparatus adapted to connect directly to an internal combustion engine and to lower the nitrogen oxide, hydrocarbon and carbon monoxide content of exhaust gas from said internal combustion engine, said apparatus comprising a catalytic reactor and a non-catalytic thermal reactor, said catalytic reactor comprising an elongated catalytic reactor housing formed by a side wall and end closures and having at least one exhaust inlet in said side wall adapted to connect directly to the exhaust ports of said internal combustion engine, an exhaust passage from said catalytic reactor to said thermal reactor, a longitudinal catalyst bed, longitudinally positioned perforate catalyst retainer members in spaced relationship forming a catalyst chamber in the space between said retainer members adapted to hold said catalyst bed, the edges of said retainer members being slidably fit into the U-slot of channel members attached to said side wall and end closures whereby substantially all of said exhaust gas passes through said catalyst bed in moving from said at least one exhaust inlet to said exhaust passage, said thermal reactor comprising an elongated thermal reactor housing positioned substantially parallel and immediately adjacent to said catalytic reactor such that said catalytic reactor and said thermal reactor form a two compartment engine manifold, said thermal reactor being further characterized in being without means for injecting supplemental fuel or supplemental ignition means, means for injecting air into said exhaust gas between said catalyst bed and said thermal reactor and an exhaust gas outlet in said thermal reactor housing.

3,911,677
INJECTION MOULDING MACHINES

George T. Collins, Sutton Coldfield, England, assignor to British Industrial Plastics Limited, Manchester, England

Continuation-in-part of Ser. No. 318,940, Dec. 27, 1972, abandoned. This application June 21, 1974, Ser. No. 482,029
Claims priority, application United Kingdom, Dec. 28, 1971, 60222/71
Int. Cl. F15b *9/03*
U.S. Cl. 60—368 **7 Claims**



1. An injection moulding machine for the moulding of synthetic resin materials, said machine being operated by hydraulic power and including hydraulic pumping means for supplying the power and a variable speed electric motor for driving the hydraulic pumping means, electronic controller means for controlling the electrical power supply to said variable speed electric motor, said electronic controller having selectively adjustable speed reference means and torque reference means adjustable respectively in accordance with predetermined hydraulic flow and pressure requirements of the machine during an injection moulding cycle, said electronic controller selectively controlling the electrical power supply to said variable speed electric motor in accordance with the settings of said speed reference means and said torque reference means.

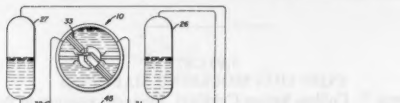
3,911,678
SAFETY SHUT-OFF FOR PUMP

Homer J. Shafer, and David P. Gerber, both of Mansfield, Ohio, assignors to Shafer Valve Company, Mansfield, Ohio

Filed Nov. 7, 1974, Ser. No. 521,764
Int. Cl.² F15B *20/00*
U.S. Cl. 60—400 **4 Claims**

1. A safety shut-off for a reciprocating piston type hand pump connectible to a fluid storage reservoir connected to a source of pressure, there being control valve means for selectively connecting said hand pump to said storage reservoir and having suction and discharge passageways selectively connectible with said pump, a ball check for normally closing said suction passageway and for opening said passageway during the suction stroke of the pump, and a normally open safety

piston valve in said suction passageway operably connected to said source of pressure in advance of said fluid storage reservoir for closing off said suction passageway upon to a sudden increase in source pressure.

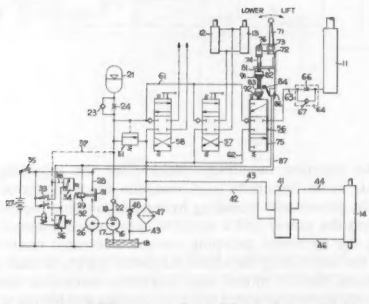


3,911,679

CLOSED CENTER HYDRAULIC SYSTEM WITH PUMP AND ACCUMULATOR OUTPUT FOR HIGH SPEED LIFT

Dean A. Matthews, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 26, 1974, Ser. No. 536,564
Int. Cl.² F15B 1/02, 11/16
U.S. Cl. 60—413 **8 Claims**



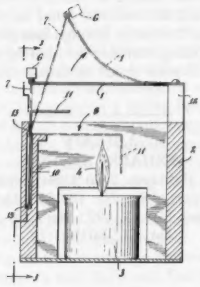
1. A two speed lift system for a lift truck, comprising:
a reservoir,
an accumulator,
a pump connected in fluid receiving relation to said reservoir and fluid delivery relation to said accumulator,
a lift jack,
a closed center control valve having neutral, raise and lower positions of adjustment,
a fluid supply line interconnecting said accumulator and said control valve,
a fluid delivery line interconnecting said control valve and said lift jack,
a source of electric energy,
an electric motor connected in driving relation to said pump,
a power circuit interconnecting said electric motor and said source of electric energy,
first electric control means operatively associated with said motor, source of electric energy and accumulator automatically maintaining the pressure in said accumulator between predetermined minimum and maximum values, and
second electric control means including a manually operable switch for selectively energizing said electric motor to cause same to drive said pump independently of the value of the pressure in said accumulator when said switch is actuated,
said lift jack being supplied with fluid from said accumulator when said control valve is placed in its raise position of adjustment of said manually operable switch is not actuated,
said lift jack being supplied with fluid from said accumulator and from said pump when said control valve is placed in its raise position of adjustment and said manually operable switch is actuated.

3,911,680

INTERMITTENT BIMETALLIC-OPERATED MOTOR

Curtis Blanchard, Osterville, Mass., assignor to General Housewares Corporation, Stamford, Conn.

Filed Nov. 22, 1974, Ser. No. 526,233
Int. Cl.² F03G 7/06
U.S. Cl. 60—529 **8 Claims**



1. A bimetallic actuated motor comprising, in combination, a bimetallic strip mounted at one end with a weight at the free end, source of heat positioned below the bimetallic strip and, when unshielded therefrom, permitting radiant heat and rising hot air to strike the strip, a shutter of dimensions wider than the bimetallic strip and capable when positioned over the source of heat to shield the bimetallic strip from heat, a flexible element having sufficient stiffness to push attached to the free end of the bimetallic strip and at its other end to an edge of the shutter, a channel in which the element and shutter fit when the bimetallic strip is in its cooled position, and an opening at the top of the channel permitting the shutter when raised to tip over the source of heat, a driving pin projecting from the element connecting strip to shutter which moves up and down therewith, whereby when heat strikes the bimetallic strip it bends or curls up, pulling up the shutter in the channel and causing it to tip over the source of heat, shielding the bimetallic strip therefrom and permitting cooling.

3,911,681

CONTROL MEANS FOR A TWO-STAGE SERVOMOTOR

William C. Sisco, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 20, 1974, Ser. No. 481,433
Int. Cl.² F15B 7/00
U.S. Cl. 60—553 **12 Claims**

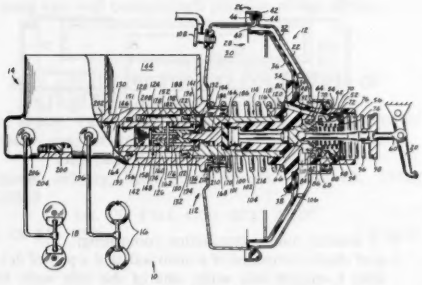
1. In a power braking system having a servomotor for supplying an operational force to the wheel brakes upon movement of a wall means by a pressure differential acting thereacross in response to an input force from an operator in a first mode of operation, control means for modifying the operational force in response to an input force in a second mode of operation, said control means comprising:
a housing having a bore therein having a first diameter connected to a reservoir by a first port and a second port and a second diameter connected to said wheel brakes;

piston means fixed to said wall means having a first diameter surface located in the first diameter of the bore to form a first pressurizing chamber and a relief chamber therein and a second diameter surface located in the second diameter of the bore to form a second pressurizing chamber therein, said piston means having an axial passageway with a first radial passage for communicating the first pressurizing chamber with the second pressurizing chamber and a second radial passage for communicating the first pressurizing chamber with the relief chamber;

first valve means located within the axial passageway for controlling communication therebetween with the second pressurizing chamber;

second valve means located within the axial passageway for controlling communication therebetween with the relief chamber; and

actuator means located within the axial passageway responsive to a first pressurizing force developed by the first



diameter surface moving within the first diameter of said bore for maintaining the first valve means in an opened position to allow unrestricted communication through the first radial passage into the axial passageway and said second valve means in a closed position in said first mode of operation until said input force from the operator exceeds said first pressurizing force to permit the actuator means to move forward within the axial passage to initiate said second mode of operation by sequentially closing the first valve means to interrupt communication of the first pressurizing force to the second chamber and open the second valve means to proportionally reduce the first pressurizing force in the first chamber by establishing communication with the relief chamber as a function of the input force to allow the pressure differential across said wall means to correspondingly move the second diameter surface within the second diameter to establish a second pressurizing force for operating the wheel brakes.

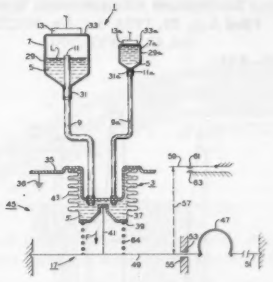
3,911,682

THERMAL ACTUATOR

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 28, 1974, Ser. No. 484,282
Int. Cl.² F03G *7/06*
U.S. Cl. 60—531 **50 Claims**

1. A thermal actuator comprising means for performing work in response to a vaporizable fluid applied thereto, and a pair of means for containing the vaporizable fluid and operable generally sequentially to respectively apply at least a portion of the vaporizable fluid contained therein to the performing means to effect the work thereof, the application of the vaporizable fluid from one of the containing means to the performing means being effective to establish the work thereof at an amount less than a predetermined value and the application of the vaporizable fluid from the other of the containing means to the performing means being effective to



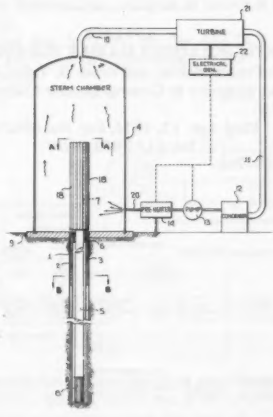
increase the work thereof to an amount at least as great as the predetermined value.

3,911,683

EFFICIENT AND NONPOLLUTING METHOD FOR RECOVERING GEOTHERMAL HEAT ENERGY

John H. Wolf, 1710 22nd St., Lake Charles, La. 70601

Filed Dec. 12, 1974, Ser. No. 532,213
Int. Cl.² F03G *7/00*
U.S. Cl. 60—641 **7 Claims**



1. The method of converting geothermal heat energy to electricity comprising the steps of:

drilling a borehole into the earth to a depth sufficient to reach strata having geothermal temperatures on the order of at least 240°F;

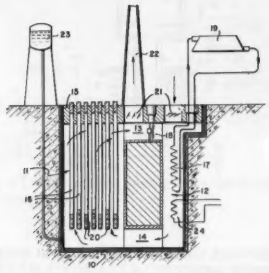
inserting a heat pipe into said borehole, said heat pipe being of a type which conducts heat from one of its ends to the other, the heat pipe being inserted with said one end in said hole and the other end proximate the surface; and

converting heat which is conducted to said other end of said heat pipe to another form of energy.

3,911,684
METHOD FOR UTILIZING DECAY HEAT FROM RADIOACTIVE NUCLEAR WASTES

Harold M. Busey, Bethesda, Md., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,726
Int. Cl.[2] F03G 7/00
U.S. Cl. 60—644 3 Claims

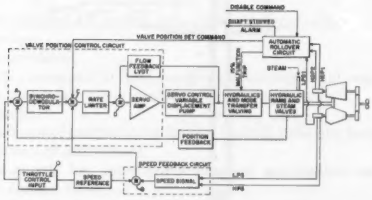


1. A method of disposing of high-level radioactive fission products or waste materials and simultaneously utilizing the heat therefrom, comprising solidifying the wastes, encapsulating the solidified wastes, transferring the encapsulated solidified wastes to a facility having a large excess of capacity and lowering them into one of a plurality of vertically disposed storage tubes present therein, cooling the storage tubes by circulating a gas thereover and utilizing the heat of the heated gas, and continually adding waste capsules to the facility as they arrive at the facility over a substantial period of time.

3,911,685
AUTOMATIC ROLLOVER MARINE TURBINE CONTROL

Michael J. Cronin, Salem, and Bruce D. Taber, Boxford, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,369
Int. Cl.[2] F01B 21/04
U.S. Cl. 60—706 10 Claims



1. In a turbine control system including a valve position control circuit for controlling the flow of a motive fluid to at least one turbine; an automatic rollover circuit for providing a valve position set command signal to the valve position control circuit in response to a turbine shaft zero-speed condition, the automatic rollover circuit comprising:

a. at least one shaft speed signal input;

b. means responsive to the shaft speed signal input for detecting a zero-speed condition of the turbine shaft;

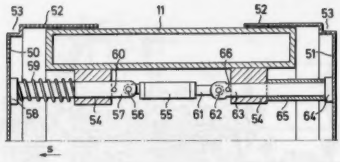
c. a valve position set circuit for providing a valve position set command signal in response to a signal from the zero-speed detection means; and,

d. means responsive to the shaft speed signal input for detecting turbine shaft rollover; the rollover detection means output signal providing a reset signal to the zero-speed detection means and the valve position set circuit upon detection of turbine shaft rollover.

3,911,686
MINERAL MINING INSTALLATIONS

Kunibert Becker, Werl; Norbert Hölken, Altlunen; Lubomir Plevak, Lunen-Horstmar, and Egon Wojaczek, Bockum-Hovel, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar, near Lunen, Westphalia, Germany

Filed Apr. 11, 1974, Ser. No. 459,986
Claims priority, application Germany, Apr. 19, 1973, 2319909
Int. Cl.[2] E21D 15/44
U.S. Cl. 61—45 D 21 Claims



1. A mineral mining installation comprising:

a goaf shield composed of a main wall and a pair of detachable L-shaped side walls, one of the side walls being disposed on one side of the main wall, the other of the side walls being disposed on the opposite side of the main wall from said one side wall, each side wall having a portion overlapping the main wall, resilient guide means for permitting said one of the side walls to move laterally inwardly in relation to the main wall, means for permitting the other side wall to move laterally inwardly in relation to the main wall, means for selectively fixing the lateral position of the other side wall in relation to the main wall, and means for adjusting the distance between the side walls;

a floor sill;

at least one hydraulically operated telescopic prop operably disposed between the floor sill and the shield;

a support member pivotably connected to the floor sill and to the shield to effectively form a continuation of the shield; and,

means for displacing the support member relative to the floor sill to alter the position of the shield.

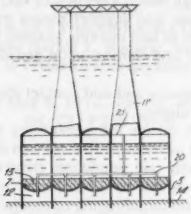
3,911,687
FOUNDATION METHOD FOR CAISSONS

Olav Mo, Groensundveien 94, 1370 Asker, Norway

Filed Apr. 19, 1973, Ser. No. 352,679
Claims priority, application Norway, May 2, 1972, 1541/72
Int. Cl.[2] E02D 17/00, 23/02
U.S. Cl. 61—46.5 15 Claims

1. A support structure for providing a support for a marine structure to be submerged onto a submarine bed, the support structure comprising: a base which is intended to rest on the sea bed and intended to project upwards from the sea bed; the base comprising a plurality of cells, and including a plurality of hollow downwardly open skirts substantially cylindrical in cross section which project downwardly from the underneath side of said base; said skirts each being formed as an integral unit with the base and having a length which enables each to be pressed down into the sea bed, whereby the deeper layers

of the sea bed soil cooperate directly with the skirts to support the marine structure in position on the sea bed; a continuous



wall formed underneath said base and along the periphery of the base, said wall comprising a plurality of said skirts.

3,911,688

PIPE APPARATUS FOR THE COLLECTION OF PETROLEUM FROM DEEP WATER WELLS

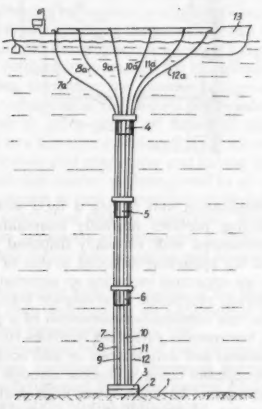
Isaac Behar, Paris, and Maurice Génini, Creteil, both of France, assignors to Coflexip, Rueil-Malmaison, France

Filed Sept. 10, 1973, Ser. No. 395,837

Claims priority, application France, Sept. 13, 1972, 72.32438

Int. Cl.² F16L *1/00;* **B63B** *35/00*

U.S. Cl. 61—72.3 **7 Claims**



1. Piping apparatus for the collection of oil derived from a wellhead in deep water comprising:

a float immersed in said water below the zone affected by the surface swell,

a lower first bundle of flexible tubes located between said float and the wellhead, said tubes being maintained in tension by said float in positions spaced one from the other,

an upper second bundle of flexible tubes located between said float and the surface of the water, each of the tubes of said second bundle being connected to a tube of said first bundle, and means maintaining the upper end of said upper bundle of tubes near the water surface.

3,911,689

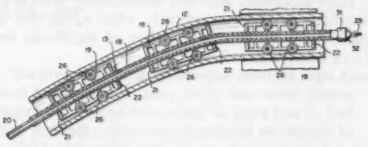
PIPE LAYING VESSEL WITH STINGER AND METHOD

Michael G. Hogan, Tulsa, Okla., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 19, 1973, Ser. No. 398,618

Int. Cl.² F16L *1/00;* **B63B** *35/04*

U.S. Cl. 61—72.3 **6 Claims**



1. Method for laying a subterranean pipeline at the floor of a body of water from a floating vessel, which comprises the steps of;

suspending a pipe support stinger from said vessel having one end thereof removably connected to the vessel and the other end directed toward the subsea floor,

said stinger including an elongated support member having a plurality of guide elements spaced longitudinally thereof to engage the inner walls of a pipeline segment, adjusting the rigidity of said continuous support member to regulate the curvature thereof between the vessel and the subsea floor by removably engaging additional support elements therewith, and

sequentially passing pipeline segments about said stinger whereby to regulate the pipe curvature during passage of the latter to the said floor.

3,911,690

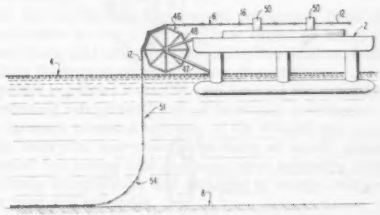
OFFSHORE PIPELINE LAYING

Bert E. Gracia, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed July 26, 1974, Ser. No. 492,263

Int. Cl.² F16L *1/00;* **B63B** *35/04*

U.S. Cl. 61—72.3 **11 Claims**



1. A method for the offshore laying of pipeline supported at its upper end on a floating vessel and at its lower end on the bed of a body of water comprising the steps of:

assembling individual rigid sections of pipe connected in end-to-end fashion for relative pivotal movement on said floating vessel to define an articulated pipeline assembly on said vessel;

said articulated pipeline assembly comprising rigid sections of pipe shorter in length than the depth of said body of water, and pivot joints interconnecting said lengths and operable to provide a plurality of pivoted, stress relieving joints in said assembly between said floating vessel and said bed of said water body when said assembly is suspended therebetween;

feeding said articulated pipeline assembly in a generally fore-to-aft direction relative to said vessel toward a pipeline discharge zone of said vessel;

guiding said articulated pipeline assembly at said discharge zone from its fore-to-aft direction of feed through a progressive direction changing zone into at least a substantially vertical path of descent in said body of water;

said articulated pipeline assembly, when in said progressive direction changing zone, including

plural rigid lengths and pivot joints articulated in a generally curved configuration extending generally tangentially downward into said substantially vertical path;

said articulated pipeline assembly, when within said vertical path, being articulated and free of significant bending force acting thereon, with

said rigid sections depending generally vertically downwardly from said pivot joint, being spaced from said bed of said body of water, and being substantially free of significant bending forces acting thereon; and

applying restraining forces to the upper end of said articulated pipeline assembly while regulating the descent of said articulated pipeline assembly to maintain said pipeline assembly in its substantially vertical descent path during a substantial portion of its descent through said body of water prior to assuming a generally curved transitional profile as it approaches contact with the bed of the body of water;

said articulated pipeline assembly, when within said generally curved transitional profile including

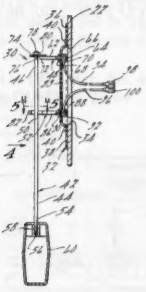
plural rigid lengths and pivot joints articulated in a generally curved configuration extending generally tangentially downwardly from said substantially vertical path.

3,911,691

ICE LEVEL SENSING MECHANISM

Vance L. Kohl, and Walter Harold Hoenisch, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Jan. 17, 1974, Ser. No. 434,009
Int. Cl.² F25C *1/00*
U.S. Cl. 62—137 **6 Claims**



1. An ice level sensing mechanism for use in an ice storage bin or the like,

said mechanism including an elongated rigid vertically disposed pendulum element, said element being fabricated of an electrically conductive material,

means pivotably supporting said element adjacent the upper end thereof whereby the lower end of said element is movable in any direction defined by an imaginary plane extending generally perpendicular to the longitudinal axis of said element,

said support means comprising an elongated horizontally oriented cantilevered member having means on the outer end thereof defining an opening lying in a second imaginary horizontal plane arranged parallel to said first mentioned imaginary plane and having the upper end of said pendulum element extending therethrough, and means on said upper end of said pendulum for supporting the same in said opening whereby said lower end of said element is movable in any direction defined by said first mentioned plane,

contact means including an annular portion defining an opening through which a portion of said element located vertically below said support means extends, with the inner periphery of said opening adapted to be engaged by said portion of said element upon preselected movement thereof,

said supporting means and said contact means being generally vertically aligned,

electrical circuit means for performing a predetermined operation and including a first portion in electrical communication with said pendulum element and a second portion in electrical communication with said contact means, with said circuit being open when said element is disengaged from said contact means and being closed when said element is engaged with said contact means,

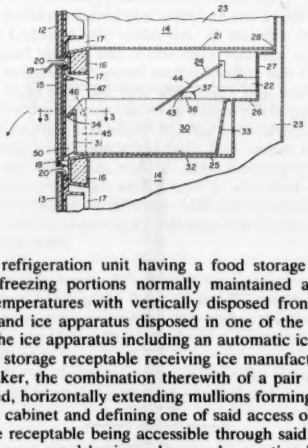
a mounting plate for operatively mounting said mechanism in a vertical orientation and fabricated of an electrically non-conductive material.

3,911,692

EXTERIOR ICE SERVICE FOR FREEZER-REFRIGERATORS

Richard D. Maxwell; John J. Pink; Michael J. Fitzharris, all of Cedar Rapids, and Louis R. Marz, Homestead, all of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 16, 1974, Ser. No. 433,902
Int. Cl.² F25C *1/04*
U.S. Cl. 62—137 **2 Claims**



1. In a refrigeration unit having a food storage cabinet including freezing portions normally maintained at below freezing temperatures with vertically disposed front access openings, and ice apparatus disposed in one of the freezing portions, the ice apparatus including an automatic ice maker and an ice storage receptable receiving ice manufactured by the ice maker, the combination therewith of a pair of vertically spaced, horizontally extending mullions forming a fixed part of the cabinet and defining one of said access openings, the storage receptable being accessible through said one access opening; a panel having a lower edge portion hingedly secured along the lower mullion for swingable movement between a normally closed position in which the panel cooperates with the cabinet including the mullions to close said one access opening and an open position outwardly of the cabinet for access to the storage receptacle, the storage receptacle comprising a tray having a pair of side walls, each side wall including an outwardly opening channel therein extending between its upper and lower edges, the panel including means carried thereby normally received in the channels and engaging respective side walls thereof effective to provide slidable movement of the tray on a shelf in said one freezing portion from a normal position therewithin out through said one access opening when the panel is swung to its open position and to return the tray to its normal position when the panel is swung to its closed position; and hinged door means having a normally closed position in which the door means cooperate

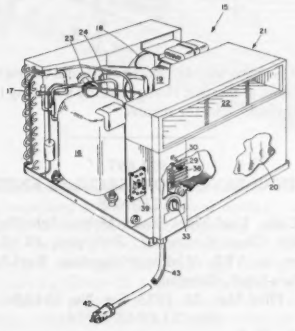
with the cabinet including the mullions to close the remainder of the access openings and movable to an open position for access to the remainder of the freezing portions.

3,911,693

HAZARDOUS DUTY ROOM AIR CONDITIONER

Jack D. Seigler, and Gerald L. Rodgers, both of San Antonio, Tex., assignors to Friedrich Refrigerators Inc., San Antonio, Tex.

Filed May 6, 1974, Ser. No. 467,146
Int. Cl.² F25B *49/00*
U.S. Cl. 62—151 **5 Claims**



1. An air conditioner for use in a hazardous environment, said air conditioner including a condenser, evaporator and compressor connected in the normal manner with the compressor compressing refrigerant to a high pressurized gaseous state, the condenser changing the gas refrigerant to a liquid by giving off heat, and the evaporator allowing a rapid expansion of the liquid refrigerant to change the refrigerant to a gas by absorbing heat, thereafter the gaseous refrigerant being returned to the compressor, first means for circulating air over said condenser to aid in giving off heat with said heated air being moved to a non-air-conditioned area, second means for circulating air over said evaporator and having heat absorbed therefrom with said cooled air being used to air condition an area, improvements in said air conditioner includes:

means for controlling said air conditioner being automatic for use in hazardous environments so that sparks from said control means will not ignite said hazardous environment;

means for excluding hostile elements of the hazardous environment from entering the air conditioned area through said second circulating means; and

means for preventing freeze-up of said air conditioner upon temperature variation, said freeze-up preventing means bypassing refrigerant from the normal cycle to prevent ice accumulation on the evaporator,

said freeze-up preventing means including a bypass valve for connecting the output of said compressor to the input thereof if input pressure goes below a predetermined level;

said excluding means including a dividing wall between said condenser and said evaporator to keep air from the air conditioned area from mixing with atmosphere in the hazardous environment, including a draining means for removing fluid formed on said evaporator without said mixing, said draining means extending through said dividing wall for providing a water trap in a recess thereof to prevent said mixing through said draining means;

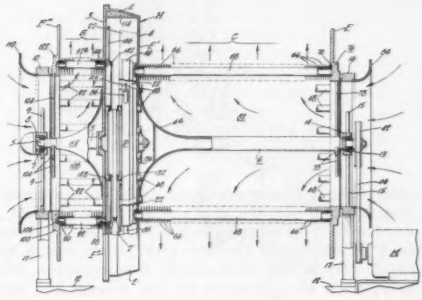
said controlling means including a solid state control device for applying power to said air conditioner, said solid state control means carrying the load current of said air conditioner and being operable by a manual switching means.

3,911,694

ROTARY COOLING AND HEATING APPARATUS

William A. Doerner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 316,851, Jan. 2, 1973, which is a continuation-in-part of Ser. No. 227,902, Feb. 22, 1972, abandoned. This application Apr. 2, 1974, Ser. No. 457,374
Int. Cl.² F25B *3/00*
U.S. Cl. 62—499 **26 Claims**



1. Rotary cooling and heating apparatus comprising,

a cylindrical housing mounted for rotation about the axis thereof,

a compressor mounted coaxially in the housing for rotation therewith including a coaxial rotor rotatable independently relative to said housing for compressing refrigerant,

a condenser mounted coaxially of the housing and rotatable therewith comprising a plurality of axially spaced annular fins having heat exchange tubes extending longitudinally therethrough,

means for conducting compressed refrigerant from the compressor to the condenser heat exchange tubes for condensing said refrigerant therein by heat exchange with a fluid discharged outwardly through said fins,

refrigerant expander means in said housing for expanding condensed refrigerant received from said condenser,

an evaporator mounted coaxially of the housing and rotatable therewith comprising a plurality of axially spaced annular fins having heat exchange tubes extending longitudinally therethrough and arranged to receive refrigerant from said expander,

means for returning vaporized refrigerant from said evaporator to the housing,

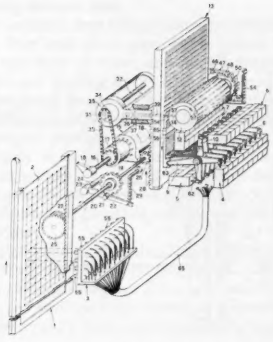
means operable to rotationally drive a selected one of said rotor and housing-condenser-evaporator unit including fixed-ratio transmission means in the housing connected between the rotor and said housing constructed and arranged whereby the rotor and housing rotate at predetermined first and second relative speeds respectively and the speed of said housing is operable to cause a gaseous heat exchange fluid to be conveyed and accelerated by viscosity shear forces outwardly between the fins of the condenser and evaporator to the velocities providing optimum heat exchange between said gaseous fluid and the refrigerant in the heat exchange tubes of the condenser and evaporator,

and a torque anchor non-rotatable in said housing cooperable with said transmission means for generating the necessity counter-torque force to oppose the generated reaction torque.

3,911,695
APPARATUS FOR THE AUTOMATIC INSERTION OF PINS IN A CYLINDER FOR A HOSIERY MACHINE

Mario Piro, Genova, Italy, assignor to Nuova San Giorgio S.p.A., Genova-Sestri, Italy

Filed Dec. 20, 1973, Ser. No. 426,700
Claims priority, application Italy, Dec. 22, 1972, 33562/72
Int. Cl.[2] D04B 37/04
U.S. Cl. 66—1 R 10 Claims



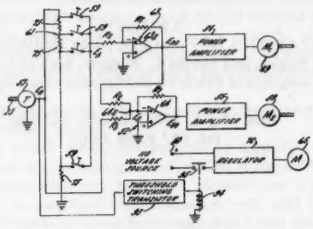
1. A pin inserting machine for a cylinder for a hosiery machine, said cylinder having a plurality of rows of pin receiving holes arranged along generating lines of the cylinder, said machine comprising support means for rotatably supporting the cylinder, a pinholding magazine equipped with a plurality of rows of pins, first drive means for moving stepwise synchronously the magazine and the cylinder so as to bring at every step of movement a different row of pins of the magazine in alignment with a different row of holes of the cylinder, a row of pushers, means supporting said pushers for alignment with a row of pins in said magazine at a time when the row of pins are aligned with a row of holes in the cylinder, second drive means for reciprocating said pushers in synchronism with the movement of the magazine and the cylinder so as to push respective ones of the pins of the aligned row of pins of the magazine into corresponding holes of the aligned row of seatings of the cylinder, closing means for closing the aligned holes of the cylinder, and control means for controlling the translation of selected ones of said closing means according to a predetermined program and in synchronism with the movement of said magazine, the cylinder and said pushers.

3,911,696
TEXTILE MACHINE WITH IMPROVED PATTERN CONTROL SYSTEM

Eric A. Buckholtz, Janesville, and Werner M. Randell, Milton, both of Wis., assignors to Norwood Mills, Inc., Janesville, Wis.

Filed June 3, 1974, Ser. No. 475,644
Int. Cl.[2] D04B 9/14
U.S. Cl. 66—9 B 18 Claims

1. In a textile machine adapted to form fabric by mixing fibers of at least two different colors, the combination comprising a device driven at a predetermined speed for blending and forming the two colors of fibers into a fabric, first and second feed units driven by first and second motors for transferring the two respective colors of fibers into said device at rates respectively proportiona' to the speeds of those motors, means for producing a first signal proportional to the speed of said device, selector means for producing a second signal which is an adjustable fraction of said first signal, means for energizing said first motor to run at a speed proportional to said second signal, and means for energizing said second motor to run at a speed proportional to the difference between said first and second signals, whereby the combined rate of feed of said two colors of fibers into said device remains

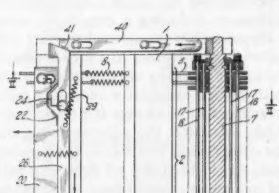


proportional to the speed of said device and the mix of the two blended colors of fibers is changeable by adjusting the fraction produced by said selector means.

3,911,697
PATTERN DEVICE FOR CIRCULAR KNITTING MACHINES

Dietrich Cotte, Karl-Marx-Stadt; Holger Scheffler, Lichtenstein, and Claus Kertzscher, Zschopau, all of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Mar. 26, 1973, Ser. No. 344,656
Int. Cl.[2] D04B 15/74
U.S. Cl. 66—50 B 8 Claims

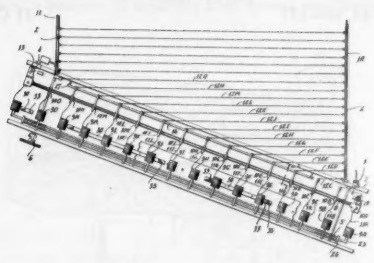


1. A circular knitting machine comprising a cylindrical pattern drum comprising disk means supporting a plurality of radially spaced cams each mounted for pivotal movement about an axis parallel to but offset from the drum axis, said cams being movable about their pivotal axes between an operative and a non-operative position, the angular movement between those positions being less than 90°, a plurality of said disk means arranged in a stack, a plurality of locking elements each associated with a plurality of radially aligned ones of said cams of said disk means and operable to secure the associated cams in selected ones of said positions, said cams cooperating with selector elements associated with stitch-forming means and means for disengaging the selectors from the cams, each of said locking elements passing through a cam to secure it in said operative position and holding others of the cams with which it is associated against a fixed abutment in the non-operative position, said locking means being common to radially aligned ones of said cams in said stacks.

3,911,698
THREAD FEEDING DEVICE FOR INSERTED WEFT KNITTING MACHINES

Richard L. Walford, Bloomfield, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed July 1, 1974, Ser. No. 484,650
Int. Cl.² D04B *23/06*
U.S. Cl. 66—84 A **5 Claims**



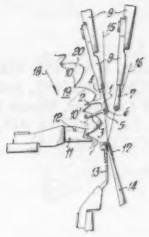
1. In an elastic weft thread feeding device for warp knitting machines comprising a first and second endless carrier with yarn clamping means thereon for opening and closing to clamp on weft thread, a third endless carrier provided with a plurality of yarn packages, each package having associated with it and moving therewith a tensioning means which, with elastic yarn, act as gripping means for the yarn, the endless carriers being synchronously driven and positioned so that as a package comes adjacent to the clamping means on the first carrier the means opens, clamps the yarn from the package, and then strings out the yarn as the package continues to move, the tensioning or gripping means being provided with means for applying pressure to the yarn intermittently to hold the yarn as it is grasped by the clamping means on the first carrier, maintaining gripping for a short distance beyond, the pressure then being released until the package approaches the clamping means on the second carrier and reactuated for a short distance as the package transfers its yarn to said clamping means on the second carrier, the yarn being tension free during the major portion of the travel of each package between carriers, the impovement which comprises means for producing relative motion between packages having yarns that are elastic and a surface whereby the packages are rotated and yarn is unwound therefrom under substantially no tension, and means for intermittently braking the rotation of the yarn packages for sufficient periods to string the yarn from carrier to carrier in predetermined length when relaxed and at a predetermined tension, cutting means for cutting the elastic yarn after the package has passed the second carrier chain, and means for producing relative motion between the package and the surface, the package being free to turn, whereby a predetermined amount of yarn is wound off under substantially no tension and a tail is formed from the package of suitable length for clamping to the first carrier chain when the package passes across it.

3,911,699
FORMED SINKER IN WARP KNITTING MACHINES WITH DEVICES FOR HANDLING LONG WEFTS

Heinz Kamp, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Germany

Filed Apr. 16, 1974, Ser. No. 461,348
Claims priority, application Germany, Apr. 17, 1973, 2319348
Int. Cl.² D04B *23/00, 27/00*
U.S. Cl. 66—86 M **3 Claims**

1. In a warp knitting machine with devices for handling long weft threads and for feeding the threads to knitting tools of the machine and a guide bar carrying a plurality of eye needles having elongated shanks, means to support in separated relation weft threads fed to and extending along the knitting tools, at least one formed sinker also carried by the guide bar and comprising a pair of tongue-like support members extending at predetermined mutual spacing substantially parallel to one another and substantially perpendicularly to the shank of at least one of the eye needles of the guide bar, said support members having respective free ends defining an opening for

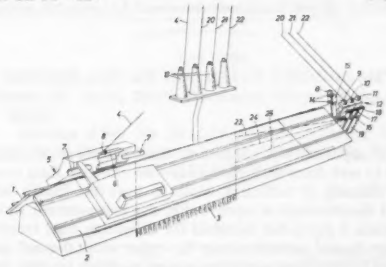


the space between said substantially parallel support members, said opening facing in a direction toward said support means for the weft thread, said support members and said weft thread support means being relatively displaceable so as to transfer respective weft threads from said support means through said opening into the space between said support members.

3,911,700
FLAT KNITTING MACHINE WITH YARN CHANGE MECHANISM

Karl Tschumperlin, Dietikon, Switzerland, assignor to MADAG Maschinen-und Apparatebau Dietikon AG, Dietikon, Switzerland

Filed July 31, 1973, Ser. No. 384,250
Claims priority, application Germany, Aug. 16, 1972, 2240158
Int. Cl. D04b *15/52*
U.S. Cl. 66—127 **1 Claim**



1. In a flat knitting machine having a yarn change mechanism and stitch stripper and a cam assembly which can be moved to-and-fro over at least one needle bed as well as yarn guides having outlet ends and located laterally of the needle bed and each associated with a respective yarn, the yarn guides being movable via a control mechanism controlled by the movement of the cam assembly into or out of the knitting position, the improvement comprising a plurality of support levers each having holders for releasably holding a respective one of said yarn guides, each of said support levers being movable from a first, lower position to a second, upper position, said first position being the rest position of said yarn guides, said second position being the position by which said cam assembly can pass alongside said yarn guide and transfer said yarn guide into and out of the knitting position, the outlet

end of said yarn guide in its first position being located below the last knitted course of yarn to prevent entanglement of yarn from said outlet to said knitted fabric by said cam assembly movement, the outlet end of said yarn guide in the second position situated at an elevation above the outlet ends of said yarn guides in its rest position, said elevation being approximately the same as the last knitted course of yarn in the knitting position.

3,911,701

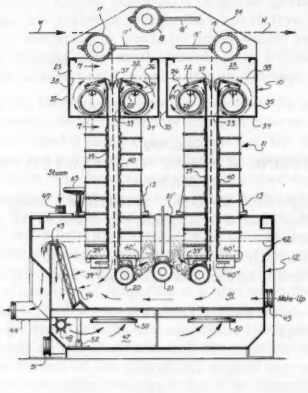
CARPET FABRIC WASHING MEANS

Dieter Friedrich Zeiffer, Charlotte, N.C., assignor to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Filed Dec. 17, 1973, Ser. No. 425,542

Int. Cl.² D06B *3/10*

U.S. Cl. 68—18 F **11 Claims**



1. In apparatus for continuous fluid treatment of carpet fabric in web form that incorporates an elongate fluid treatment cascade of sufficient width to have the carpet web passed therethrough at open width, the improvement which comprises a pump-fed manifold for delivering fluid treating medium to said cascade across the entire width thereof, said manifold comprising a tubular header in which treating medium is initially received for delivery, a plurality of lateral discharge fittings spaced lengthwise of said header, and housing means, including an angled deflector plate facing said discharge fittings, for directing treating medium discharge from said fittings circumferentially at the exterior of said header before delivery to said cascade, said housing deflector plate being angled for directing treating medium discharge initially toward a closed housing means side aligned with said cascade, and said closed housing means side being arranged in a plane spaced parallel to tangent relation with said tubular header, whereby discharged treating medium is fanned out laterally by said deflector plate and is also directed therefrom successively through an expansion space and a following restricted elongate orifice provided by the arrangement of said closed housing means side in relation to said header with resulting lengthwise equalization of treating medium flow characteristics at said header exterior.

3,911,702

APPARATUS FOR WET TREATMENT OF STRANDS OF TEXTILE MATERIAL

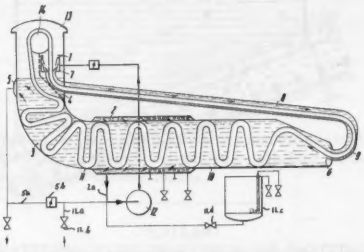
Günter Eckrodt, Coesfeld, Westphalia, Germany, assignor to Thies KG., Coesfeld, Westphalia, Germany

Filed Mar. 25, 1974, Ser. No. 454,413

Claims priority, application Germany, Mar. 24, 1973, 7311173

Int. Cl.² D06B *3/28*

U.S. Cl. 68—177 **11 Claims**



1. Apparatus for wet treatment of a strand of textile material, comprising a substantially L-shaped tubular container having an elongated substantially horizontal portion having longitudinally spaced ends, and a substantially upright portion extending upwardly from and communicating with one of said ends, said horizontal portion being completely, and said upright portion being partially filled with a treating liquid, means for discharging spent treating liquid at least from said upright portion so as to establish a liquid level therein; a tube having a cross section considerably smaller than said container portions, said tube being located at one end thereof within said upright portion and communicating at the other end thereof with the other end of said horizontal portion, said tube being inclined toward said other end and extending between the ends thereof outside said container and at least partially below said liquid level and at the other end with the other end of said horizontal portion means for withdrawing the strand of textile material from underneath said liquid level and for removing spent treating liquid therefrom; means communicating with said tube and with said upright portion above said liquid level for guiding the strand from said withdrawing means into said tube; and means for introducing fresh treating liquid into said container in the region of said guiding means and through said tube so as to advance the strand through said tube into said horizontal portion of said container where the strand is accumulated until again withdrawn by said withdrawing means and to completely fill said tube to thereby treat the strand with fresh treating liquid while the strand is advancing through said tube and with partly spent treating liquid while the strand is in said horizontal portion of said container without contact with the ambient air.

3,911,703

MACHINE FOR PROCESSING SKINS OR HIDES

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Filed July 18, 1974, Ser. No. 489,939

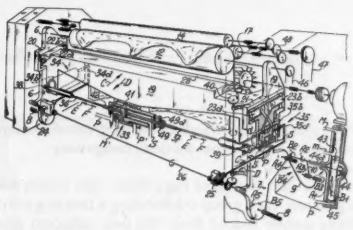
Claims priority, application Italy, Aug. 8, 1973, 27652/73; June 18, 1974, 24081/74

Int. Cl.² C14B *1/14*

U.S. Cl. 69—37 **9 Claims**

1. A device in a skin working machine for the resilient support of a skin having an average thickness and variations in the thickness, which machine comprises a framework, a skin working cylinder mounted on the framework, a beam mounted on the framework for displacement relative to the skin working cylinder and plane guide means on the beam, and the resilient support including a resilient bolster mounted

on the plane guide means for reciprocation in the plane guide means towards and away from the working cylinder, the bolster having a substantially parallelopiped shape and defining longitudinal grooves extending in the direction of the beam and a plurality of transverse bores substantially perpendicular to the grooves near an end of the bolster remote from the skin working cylinder, an opposite end of the bolster adjacent the skin working cylinder forming a nip therewith for receiving the skin, a plurality of adjusting units spaced regularly along

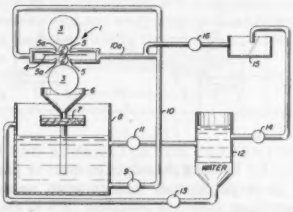


the entire length of the bolster in said direction and arranged to adjust the spacing of the opposite bolster end from the working cylinder in accordance with the average thickness of the skin being worked, and hydraulic means for displacing the beam relative to the working cylinder whereby the nip is set to a basic thickness corresponding to the average thickness of the skin being worked, and for further displacing the beam whereby the nip is set to an operating thickness corresponding to variations in the average skin thickness.

3,911,704
METAL ROLLING

Peter R. Bridenbaugh, Greensburg, Pa.; Albert J. Kovolick, Newburgh, Ind., and Sidney A. Paradee, Sun City Center, Fla., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 335,019, Feb. 23, 1973, and a continuation-in-part of Ser. No. 313,564, Dec. 8, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,718
Int. Cl.² B21B *27/10, 45/02*
U.S. Cl. 72—42 **4 Claims**

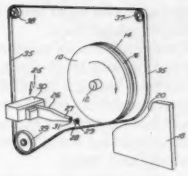


1. In hot rolling metal between work rolls, the improvement comprising applying to the metal entering the work rolls, and to the work rolls on the metal exit side thereof, a dispersion composed of water and 0.5–5% by weight of a dispersed phase consisting of mineral oil and at least one component for imparting film strength and controlling friction, the mineral oil constituting 50–80% by weight of the said dispersed phase, the said dispersion being characterized in that the dispersed phase therein is quickly separable from the water, the concentration of the said dispersed phase in the dispersion applied to the metal entering the work rolls being higher than the concentration of the dispersed phase in the dispersion applied to the work rolls on the metal exit side thereof.

3,911,705
EXTRUSION APPARATUS

William G. Voorhes, East Greenwich, R.I., assignor to Wanskuck Company, Providence, R.I.

Filed Apr. 1, 1974, Ser. No. 456,684
Int. Cl.² B21B *45/02*
U.S. Cl. 72—45 **8 Claims**



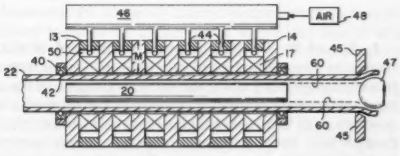
1. Extrusion apparatus comprising a passageway formed between two opposing wails in a first member, the bottom of the passageway being closed by a surface of a second member, said surface having lubricant thereon, the top of the passageway being closed by a third member, an abutment extending into the passageway and closing an end thereof, a die insert positioned against the abutment, a continuous band being guided for movement on the lubricated surface of the second member about the apparatus, the surface wall area of the first member being greater than the surface area of the band lying against the third member, means for feeding material to be extruded to said passageway, said material bearing against said band and moving the same toward said abutment.

8. A process of extruding material comprising feeding solid stock material into a passageway formed between a band and a groove in another member, moving the other member, providing die means closing one end of said passageway, providing means to support the band , moving the band at the input feed speed of the solid stock and providing continuous lubrication between the band and the support means therefor.

3,911,706
METHOD AND APPARATUS FOR FORMING METAL

Murray W. Davis, 20501 Woodmont, Harper Woods, Mich. 48225

Division of Ser. No. 349,227, April 9, 1973, Pat. No. 3,852,627. This application Aug. 2, 1974, Ser. No. 494,050
Int. Cl.² B21D *26/14*
U.S. Cl. 72—56 **10 Claims**



1. A method for continuously removing electrically conductive metal from a forming means, comprising the steps of:

providing a concentric, converging flux, linear induction motor having a hollow cylindrical stator member made of a material of high magnetic permeability, said stator member including a plurality of annular teeth having teeth faces, said teeth faces having a discrete facing of material of higher magnetic permeability than the stator member material, said teeth being longitudinally spaced

apart to define annular slots therebetween with energizable coils in said slots;

surrounding said metal with said stator and coils; and

longitudinally removing said metal from said forming means by energizing said coils.

5. An apparatus for continuously forming electrically conductive metal including:

a converging flux, concentric linear induction motor having a hollow, cylindrical stator member made of a material of a high magnetic permeability;

said stator member including a plurality of annular teeth having teeth faces, said teeth being longitudinally spaced apart to define annular slots;

a plurality of energizable coils positioned in said slots;

a discrete facing on said teeth faces, said discrete facing being of a material having a higher magnetic permeability than said stator member, said discrete facing being of a thickness sufficient to prevent magnetic saturation of said discrete facing and said stator member; and

means for forming said metal;

whereby upon energization of said coils, said formed metal is moved axially from said forming means into said concentric motor by the generation of increased magnetic flux without magnetic saturation of the stator member or discrete facing.

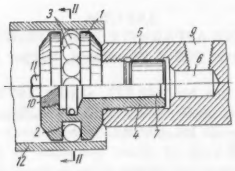
3,911,707
FINISHING TOOL

Anatoly Petrovich Minakov, poselok Kirova, 10,, Mogilev; Petr Ivanovich Yascheritsyn, Leninsky prospekt, 18, kv. 102, Minsk; Gennady Mikhailovich Mironov, Orshanskoe shosse, 120, kv. 52, Mogilev; Jury Khonanovich Golant, Orshanskoe shosse, 118, kv. 40, Mogilev; Viktor Vladimirovich Bogachev, poselok Kirova, 8a, kv. 6, Mogilev; Evgeny Nikitovich Blinov, poselok Kirova, 39, kv. 6, Mogilev, and Stanislav Vladimirovich Sokolovsky, Orshanskoe shosse, 63, kv. 30, Mogilev, U.S.S.R.

Filed Dec. 12, 1974, Ser. No. 532,002

Int. Cl.² B21D *41/02*

U.S. Cl. 72—76 **3 Claims**



1. A tool for finishing internal surfaces of revolution in blanks by the method of plastic deformation mounted for a linear displacement along the geometrical axis of the surface being machined comprising: a body in the form of a body of revolution; at least one annular groove in the peripheral surface of said body; deforming members, each comprising a body of revolution accommodated in said groove for displacement therealong and for rotation about their own geometrical axes; said body having a centrally located axial hole; at least one passage communicating with said hole in said body, said passage extending in a plane passing transversally with respect to the bottom wall of said groove, the passage being directed substantially tangentially with respect to the bottom wall of said groove and serving for supplying fluid under pressure to said deforming members which are displaced along said groove and rotate about their own geometrical axes under the action of the fluid.

3,911,708
APPARATUS FOR STRAIGHTENING LONG METAL WORKPIECES

Horst Lorenz, Solingen, and Rolf Eckhard Koch, Witzhelden, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed June 10, 1974, Ser. No. 477,830

Claims priority, application Germany, June 8, 1973, 2329345

Int. Cl.² B21D *3/04*

U.S. Cl. 72—98 **8 Claims**

1. An apparatus for straightening long metal workpieces of substantially circular cross-section, comprising:

housing means;

at least several groups of hyperbolic rolls within said housing means, each group constituting a bending triangle and being axially spaced from the next adjacent group, the number and spacing of the groups being such that the entire length of the workpiece is clampable by said rolls except for a length corresponding approximately to the distance between two contiguous groups of rolls, the construction and arrangement of the group of rolls being effective to receive the workpiece in a direction transverse to its length, and with each group straightening only a specific length of the workpiece, said length approximating said distance between said two contiguous groups, whereby said length constitutes only a fraction of the total length of the workpiece;

and drive means connecting to said rolls for driving one or more rolls of each group.

3,911,709
BENDING THE EDGES OF SHEET OR PLATE STOCK

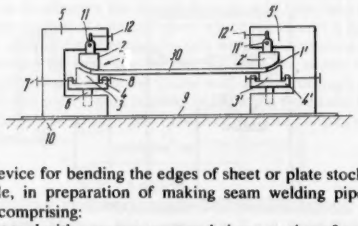
Walter Randerath, Viersen, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 11, 1974, Ser. No. 513,955

Claims priority, application Germany, Oct. 17, 1973, 2352573

Int. Cl.² B21D *5/12, 37/00*

U.S. Cl. 72—179 **9 Claims**



1. Device for bending the edges of sheet or plate stock, for example, in preparation of making seam welding pipes or tubes, comprising:

a first tool with a convex contour being a section of a circular involute and being mounted for pivoting on an axis parallel to an axis of bending;

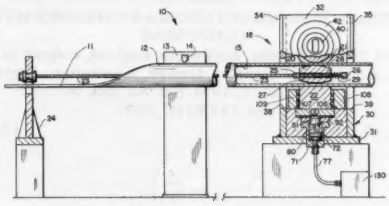
a second tool with a concave contour being a section of essentially the same circular involute, the first and second tools being mounted for lateral displacement relative to each other transverse to said axis; and

means for adjusting the final working disposition between upper and lower tool including pivoting of the first tool relative to the second tool and lateral displacement of said tools relative to each other prior to a bending operation for obtaining constant gap width as between the two contours, said tools being held in their respective adjusted position during bending.

3,911,710
METHOD AND APPARATUS FOR SMOOTHING THE INTERNAL BEAD IN TUBING

Therlow C. Gest, South Euclid, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed May 30, 1974, Ser. No. 474,524
Int. Cl.² B21D *31/06*
U.S. Cl. 72—193 **22 Claims**



1. An apparatus for smoothing internal surfaces of a tube, comprising:

a. a support;

b. an anvil movably carried by said support;

c. oscillating means mounted in spaced relationship with the anvil, said oscillating means and said anvil being movable relatively toward and away from each other for repetitively compressively engaging opposed side regions of a tube as such tube moves along a path between said oscillating means and said anvil;

d. said anvil defining a tube engaging surface portion extending longitudinally of said path which is in engagement with one side region of such tube when an internal surface of such tube is being smoothed;

e. a mandrel for positioning interiorally of such tube at a location along said path between said oscillating means and said anvil, said mandrel being operable to engage and smooth internal surfaces within such tube; and

f. fluid pressure means interposed between said anvil and said support for supporting and positioning said anvil in directions toward and away from said oscillating means to control the magnitude of the compressive forces applied to such tube by said oscillating means.

3,911,711
METHOD AND APPARATUS FOR PREVENTING STRIP ACCUMULATION

George S. Koss, Birmingham, and Jay R. Scott, Mountain Brook, both of Ala., assignors to United States Steel Corporation, Pittsburgh, Pa.

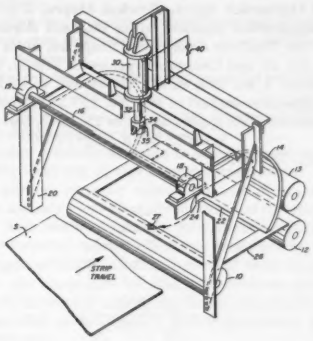
Division of Ser. No. 288,621, Sept. 13, 1972, Pat. No. 3,826,415. This application Mar. 28, 1974, Ser. No. 455,689
Int. Cl.² B21B *39/00*
U.S. Cl. 72—203 **3 Claims**

1. In combination with a high speed multistand strip mill having a pair of work rolls in each stand, apparatus for cutting a strip traveling through said mill, said apparatus comprising: a frame;

a curved knife blade having a width greater than that of said strip, said knife blade being journaled for rotation upon said frame;

means for maintaining said knife blade in a stand-by position above the path of travel of said strip, and

means for moving said knife blade into contact with said strip,

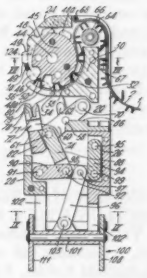


said knife blade acting as a guide for reversing the direction of travel of said strip.

3,911,712
CRIMPING TOOL

Karl Heinz Wustinger, Deutsch Waprom, and Karl Rörner, Vienna, both of Austria, assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 11, 1974, Ser. No. 487,528
Claims priority, application Austria, July 13, 1973, 6216/73
Int. Cl.² B21D *43/28*
U.S. Cl. 72—324 **9 Claims**

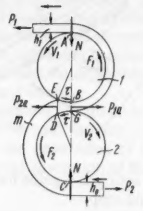


1. Apparatus for severing channel-shaped electrical terminals joined together by carrier strips in parallel side-by-side relationship to constitute a strip of terminals, from the carrier strips and for crimping the severed terminals to wires, the apparatus comprising a crimping anvil, a rotatable conveyor wheel having projections arranged to extend between the terminals of the strip, for feeding the strip of terminals step-by-step towards the crimping anvil, a readily exchangeable terminal guide member which partially surrounds the conveyor wheel and which cooperates with the conveyor wheel for guiding the terminals towards the crimping anvil, terminal strip severing means for severing each terminal from the carrier strips prior to the terminal reaching the crimping anvil, a readily exchangeable crimping die assembly cooperable with the anvil to crimp the terminals to the wires, and a wire severing blade arranged to enter a slot in the die assembly to trim the wires, prior to each crimping operation, the terminal strip severing means and the wire severing blade being mounted on said terminal guide member.

3,911,713
METHOD OF ROLLING METAL SHEET ARTICLES

Vladimir Nikolaevich Vydrin, ulitsa Svobody, 139, kv. 7; Leonid Matveevich Ageev, Ploschad Mopra, 2, kv. 33; Nikolai Vladimirovich Sudakov, ulitsa Bogdana Khmelnitskogo, 9, kv. 55; Vladimir Georgievich Sosjurko, ulitsa Teatralnaya, 21, kv. 13, and Gennady Evgenievich Trusov, ulitsa 2 Stroitelnaya, 3, kv. 194, all of Chelyabinsk, U.S.S.R.

Continuation-in-part of Ser. No. 157,257, June 28, 1971, abandoned. This application June 25, 1973, Ser. No. 373,301
Int. Cl.[2] B21B *39/05, 1/00*
U.S. Cl. 72—205 2 Claims

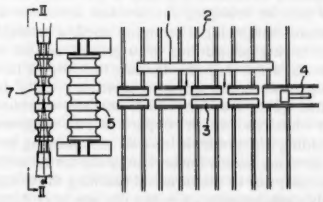


1. A method of rolling metal sheet articles by reduction of an article between driving rolls, comprising the steps of: imparting to a pair of adjacent rolls the rotation from individual motors in opposite directions at different peripheral speeds; applying to input and output portions of the article tensile forces smaller than a force necessary for the plastic deformation of the article through successive enveloping of the rolls of said pair by means of the article under tension at equal ratios of the peripheral speeds of the rolls and the thicknesses of the article before and after the rolling in the pair of adjacent rolls and at a speed of movement of the output portion of the article equal to the peripheral speed of the roll rotating at a higher peripheral speed; maintaining, by means of a hydraulic head, a required constant pressure on the rolls sufficient for the plastic deformation of the article by way of its reduction with the rolls, which permits attaining the required deformation of said articles regardless of any change in the distance between the above rolls.

3,911,714
METHOD OF AUTOMATICALLY ROTATING A HOLLOW SHELL iN A PLUG MILL

Haruo Kamimura, Yokohama; Toshitsugu Nakai, Tokyo, and Katsumi Wadano, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1974, Ser. No. 493,782
Claims priority, application Japan, Aug. 23, 1973, 48-93859
Int. Cl.[2] B21B *17/12, 39/16, 39/26*
U.S. Cl. 72—209 11 Claims



1. In a tubular product production line including a plug mill, feed means for feeding the product to said plug mill, and return means for returning a rolled hollow shell that has been subjected to a rolling pass in said plug mill to said feed means, said return means including a pair of rotatable return rolls located at the outlet side of said plug mill, a rolling method comprising:

feeding a tube to said plug mill;

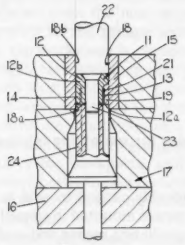
rolling said tube in said plug mill; and

engaging said rolled tube fed out from said plug mill with said pair of return rolls, and rotating said return rolls to return said engaged rolled tube back to said feed means while rotating said rolled tube by said return rolls by an angle of about 90 degrees around the longitudinal central axis of said rolled tube before said rolled tube is fed to said plug mill for a second rolling pass.

3,911,715
METHOD OF MANUFACTURING AN EXTRUDED METAL COMPONENT

David Thomas Tranter, Kenilworth, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed July 1, 1974, Ser. No. 484,787
Int. Cl.[2] B21C *23/00*
U.S. Cl. 72—256 6 Claims



1. A method of manufacturing an extruded metal component of the kind including a hollow substantially cylindrical body defining one or more axially extending splines at the external surface of the body, the method comprising the steps of:

a. starting with a hollow, substantially cylindrical metal billet,

b. engaging a first punch with one end of the billet and using said first punch to perform an extrusion operation on the billet by causing the billet to undergo movement relative to a die cavity, the extrusion operation being arranged to cause material of the billet to flow so as to produce said one or more axially extending splines, and

c. during the extrusion operation, applying a load to a second punch so as to urge said said second punch against the other end of the billet, said load being such that the second punch is moved relative to the die cavity by the material which is being extruded but said material being extruded is shaped by said second punch so as to substantially fill the die cavity during the extrusion operation and thereby define the end of the component corresponding to said other end of the billet.

3,911,716
CIRCUIT BOARD, METHOD OF MAKING THE CIRCUIT BOARD AND IMPROVED DIE FOR MAKING SAID BOARD

Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

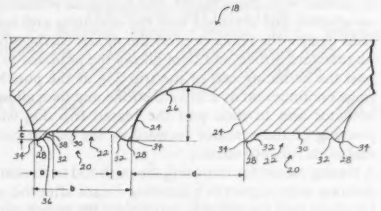
Continuation-in-part of Ser. No. 145,720, May 21, 1971, abandoned. This application Oct. 2, 1973, Ser. No. 402,816
Int. Cl.[2] B21D *43/28*
U.S. Cl. 72—324 10 Claims

1. In a die comprising at least one raised die element having a die face of a predetermined pattern and adapted to be heated and to engage a metal foil on a yielding substrate in a manner to simultaneously shear out and bond a foil section

corresponding to said die pattern against the substrate, said die face having a plane of engagement along which the die face engages the foil, said die element having side faces which have a substantial right angle component with respect to said engagement plane and which delineate said die pattern of the die element, said die having outside cavities on said side of the die element of a depth sufficient to receive excess foil without any significant pressing of such excess foil into bonding engagement with the substrate, the improvement being that said die face is configured as follows:

a. said die face having an inner middle portion and two outer shoulder portions on opposite sides of the middle portion,

b. each shoulder portion having a high pressure surface portion positioned generally in said plane of engagement



and adapted to engage said foil and press the foil against said substrate, said high pressure surface having a substantial angular component parallel to said plane of engagement,

e. each shoulder portion forming with a proximate side face of the die element an outer shearing corner,

d. the inner middle portion of the die face being recessed with respect to the shoulder die face portions so as to lie moderately beneath said plane of engagement at a depth less than that of the cavities and provide a recess area for the foil section being sheared out by the die element, and

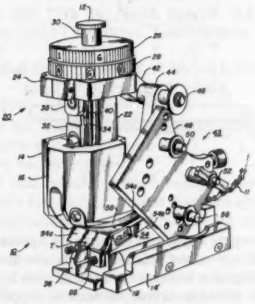
e. each shoulder portion joining to said middle portion along a blunted convexly curved transitional portion located between the middle portion and its related shoulder portion.

3,911,717

TERMINAL APPLICATOR APPARATUS

Lawrence Frank Yuda, Parma, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,630
Int. Cl.² B21D *31/02*
U.S. Cl. 72—331 **24 Claims**



1. A terminal applicator for crimping terminal connectors on wire conductors, said applicator comprising, in combination:

a frame having a ram guide portion andd a terminal platform therein;

a reciprocating ram assembly movably mounted in said ram guide, said ram assembly having an upper crimping die mounted thereon;

a lower crimping die mounted on said frame for cooperation with said upper crimping die;

means for guiding a strip of terminals along said platform and in a direction toward said dies;

a feed member pivotally mounted to said frame for translation in the direction of ram assembly movement;

a linkage member pivotally mounted at one of its ends to said ram assembly and pivotally mounted at its other end to said feed member wherein movement of said ram assembly provides translation of said feed member;

a feed finger pivotally mounted to said feed member, wherein said translation of said feed member provides oscillatory movement of said feed finger toward and away from said dies in accordance with a given feed stroke amplitude; and,

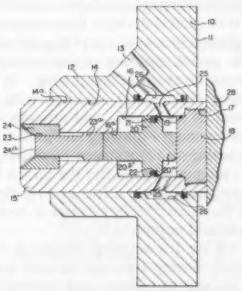
means including said feed member for unilaterally adjusting the amplitude of said feed stroke solely in the direction away from said dies thereby to accomodate terminal connectors of different size and wherein the maximum amplitude of said feed stroke in the direction toward said dies is substantially fixed and independent of said adjusting means.

3,911,718

HYDRAULIC EJECTION DEVICE

Robert E. Requarth, 22 Shawnee Road, Greensburg, Pa. 15601

Filed June 12, 1974, Ser. No. 478,689
Int. Cl.² B21D *37/16*
U.S. Cl. 72—342 **4 Claims**



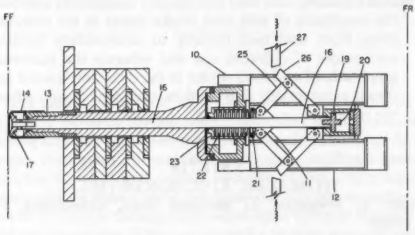
1. A unitary, self-contained hydraulic ejector for use in part-forming machinery such as headers and presses; comprising a generally cylindrical ejector causing adapted to be held snugly in, and longitudinally adjustable in, a complementary opening in a special holder or bolster in a header or the like; there being a central through opening in said casing; hydraulically operable piston-motor means in said central through opening including a piston reciprocatable in a pressure chamber and a piston rod ejector extension responsive to operation of said motor means to eject a formed part, a back plug closing the rear end of said through opening, there being a part-forming die having an opening including pressure-receiving walls in the front end of said casing in line with said ejector extension, there being an hydraulic pressure fluid passage through said casing communicating with said motor means pressure chamber in position to urge said piston-motor means forward in an ejection direction, said parts in said casing through opening

including a direct pressure-transmitting train in non-ejecting position from said pressure receiving walls to said back plug, said back plug being positioned to receive pressure directly from a press platen, and said cylindrical pressure chamber having substantially equal pressure-exposed areas in opposite directions, one on said back plug and one on said piston, practically eliminating endwise stress, whereby said casing may be fixed in operating position in a header or press and pressure applied in a known manner between two platens to form a part introduced into said part-forming opening, after which hydraulic pressure fluid may be admitted to said piston-motor means to eject the formed part.

3,911,719
HIGH SPEED EJECTOR MECHANISM

David Degenhardt, Denver, and Fred Nelson, Englewood, both of Colo., assignors to Ragsdale Brothers Inc., Englewood, Colo.

Filed Dec. 2, 1974, Ser. No. 528,778
Int. Cl.[2] B21D *45/00, 45/02, 45/04*
U.S. Cl. 72—345 **10 Claims**



1. An ejector mechanism for ejecting a workpiece from a drawing and ironing press having at least one die, a means adapted for receiving said workpiece, and a punch mounted to a powered punch carriage so adapted and arranged that the punch moves in the die(s) during a forward stroke to draw and iron the workpiece and moves out of the die(s) during a rearward stroke to permit ejection of the workpiece from the press, said ejector mechanism comprising:

a. A nosepiece reciprocally mounted with respect to the working end of the punch, said nosepiece having a forward working end for drawing and ironing the workpiece and for ejecting said workpiece by moving forward with respect to the punch just after the punch begins its rearward stroke, and having a rear end rigidly attached to a push rod for transmitting reciprocal motions from the push rod to said nosepiece;

b. A push rod for transmitting reciprocal motions to the nosepiece by having one end of said push rod rigidly attached to the nosepiece and another point fixedly mounted for reciprocation therewith, to a damping means and by having another point on said push rod fitted with at least one connector for pivotal connection with at least one actuator arm and by having another point fitted with a means for fitting a biasing means which returns the push rod to a position far enough to the rear that the nosepiece returns to the working end of the punch after a forward force delivered by the actuator arm is removed and before the punch carriage completes its rearward stroke;

c. At least one actuator arm for transmitting forward forces to the push rod from an actuator arm and for transmitting rearward forces from the push rod biasing means to the actuator arm by having one end of the actuator arm pivotally connected to the push rod and the other end pivotally connected to an actuator;

d. At least one actuator pivotally mounted to the ram carriage at one end and pivotally mounted to the actuator arm at some point adjacent to the actuator's punch carriage pivot mounting so that the actuator pushes the actuator arm forward when the actuator is forced to pivot forward about the actuator's punch carriage pivot mounting by a levered pivot action delivered to the actuator by a trip dog after the punch carriage begins its rearward stroke with said actuator being so adapted and arranged that it initially jams against the trip dog to create the levered pivot action of the actuator about its punch carriage pivot mounting and then slides past the trip dog when the actuator has pivoted far enough forward to allow the actuator to slide past the trip dog as the punch carriage continues on its rearward stroke and then allows the actuator to slide past the trip dog without creating any levered pivot action during the forward stroke of the punch carriage;

e. At least one trip dog, having a biasing means to return the trip dog to an actuating position when the trip dog is not in contact with the actuator, and having an actuating end so adapted and arranged that the actuating end initially jams against the actuator after the punch carriage begins its rearward stroke and then allows the actuator to slide past the actuating end of the trip dog as the punch carriage continues on its rearward stroke and then allows the actuator arm to slide past the biased trip dog without pivoting of the actuator forward as the punch carriage makes its forward stroke;

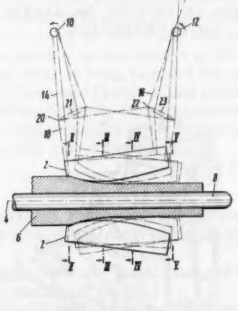
f. A biasing means for returning the push rod to its rearward position with respect to a damping means after the actuator slides past the trip dog, but before the punch carriage completes its return stroke:

g. A damping means mounted to the punch carriage and reciprocally mounted to the push rod for damping the return of the nosepiece to the punch during the period the push rod is under the influence of the biasing means after the actuator slides past the trip dog during the rearward stroke of the punch carriage.

3,911,720
APPARATUS FOR STRETCH FORGING AND APPARATUS FOR FORMING THE SAME

Friedrich Kocks, Freiligrathstrasse 1, 4 Dusseldorf, Germany

Continuation-in-part of Ser. No. 154,749, June 21, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 411,500
Int. Cl.[2] B21J *9/18*
U.S. Cl. 72—406 **4 Claims**



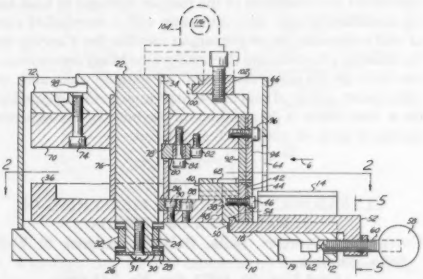
1. Stretch-forging apparatus comprising a plurality of swinging jaws which are offset relative to one another around the run-through axis of a workpiece, each of which jaws depending from two drivable crank devices or eccentric devices moving the jaws toward and away from the axis of said workpiece, means engaging said workpiece by which said workpiece is rotatable through a predetermined angle about its

axis, the swinging jaws when in their moved-together state forming a closed sizing gap around the run-through axis of the workpiece whereby the workpiece is substantially completely enclosed within the jaws and means in the configuration of the working surface of each swinging jaw in the region of contact with the workpiece such that a portion of the workpiece is radially deformed within the jaw at least a portion of the working surface of the swinging jaws being of arcuate construction in the plane lying at right angles to the run-through-axis of the workpiece, each said swinging jaw having a working surface with a radius of curvature in the cross-section at right angles to the run-through axis of the workpiece in the region of the deforming part greater than the shortest distance between the centre of the sizing gap and the working surface.

3,911,721
TERMINAL APPLICATOR

Joseph W. Baldyga, Mount Clemens, Mich., assignor to Diamond Die & Mold Co., Mount Clemens, Mich.

Filed Sept. 3, 1974, Ser. No. 502,346
Int. Cl.² B21J *7/46*
U.S. Cl. 72—441 **15 Claims**



1. A terminal applicator for testing terminal application of a plurality of different terminals to wires associated with respective ones of said terminals comprising a ram, quick adjustable means for selectively controlling the force to be applied by the ram in terminal application, movable storage means for a multiplicity of punch and anvil sets, a terminal nest block associated with each set, said storage means being movable to bring a selected terminal nest block and associated punch and anvil set into a predetermined operating position, and means for actuating said ram to cause said punch to crimp a selected terminal to a selected wire end under the selectively controlled force of the ram.

3,911,722
DEVICE FOR FASTENING ORNAMENTATION TO FLEXIBLE MATERIAL

Barry Levine, 300 77th St., North Bergen, N.J. 07047, and David Levine, 1003 Lynn Drive, Valley Stream, Long Island, N.Y. 11580

Filed July 1, 1974, Ser. No. 484,693
Int. Cl.² B21J *13/02, 13/03*
U.S. Cl. 72—479 **2 Claims**

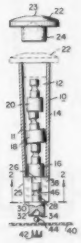
1. A device for fastening ornamentation having attaching prongs to flexible material comprising:

an elongated handle portion;

one end of said handle portion being formed to have a substantially flat surface so that pressure applied thereto effects longitudinal downward movement of said device; a setting head;

the other end of said handle portion including means to receive said setting head in mounted engagement therein; said handle portion having an inner bore and an outer surface, said inner bore being free of any attached element to thereby form an elongated receptacle extending from said substantially flat end surface to said other end, and said outer surface extending freely from said substantially flat end surface to said other end without being in contact with any other element of said device;

said setting head having depression means formed therein conforming in shape to said ornamentation and adapted upon the application of said pressure to bend the prongs



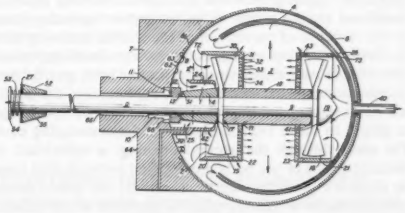
of said ornamentation to fasten said ornamentation to said flexible material; and

said handle portion being formed of thermoplastic material, said engaging means being formed as a longitudinal slot opening into said other end and spreadable so that said thermoplastic material can tightly grip said setting head.

3,911,723
EXPONENTIAL DILUTION FLASK

Joseph J. Ritter, Mount Airy, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 8, 1974, Ser. No. 495,754
Int. Cl.² B01F *3/02*
U.S. Cl. 73—1 R **15 Claims**



15. A method of mixing a sample gas and a carrier gas comprising,

providing a substantially spherical shell,

introducing said sample gas and said carrier gas to said shell, dividing said introduced gas into a plurality of gas streams,

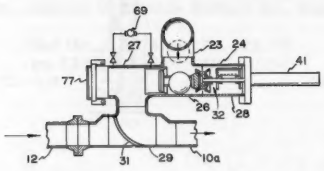
causing some of said streams to collide head on with others of said streams to effect mixing,

outputting a small portion of said mixed gas from said shell, recycling the remainder of said mixed gas for re-division and re-combination.

3,911,724
SPHERE LAUNCHER AND METER PROVER APPARATUS AND METHOD

Marvin H. Grove, Houston, and Ronald G. Dunegan, Katy, both of Tex., assignors to M & J Valve Company, Houston, Tex.

Continuation-in-part of Ser. No. 331,252, Feb. 9, 1973, abandoned. This application Jan. 17, 1974, Ser. No. 434,088
Int. Cl.² G01F 25/00
U.S. Cl. 73—3 15 Claims



1. In a sphere launching device, a hollow body, one side wall of the body having a first opening adapted to be connected with a source of fluid and through which a sphere may pass into a first space within the body, a shuttle assembly disposed within the body, said shuttle assembly including a plunger, sphere guard means secured to and extending from one end of the plunger and a sphere carrier secured to and extending from the other opposite end of the plunger, the carrier having a sphere accommodating cavity dimensioned to permit a sphere to move into the same from the first opening, said assembly being movable in opposite directions between a first sphere launching position and a second sphere receiving position, a second opening in one side wall of the body through which a sphere may pass out from a second space within the body, the spacing between the centers of said openings as measured along the axis of the body corresponding generally to the distance of movement of the shuttle assembly between its first launching and second sphere receiving positions, whereby in said first operating position the guard means is positioned to obstruct entrance of a sphere into the body from the first opening and the sphere carrier is positioned to permit a sphere to move from the sphere accommodating cavity of the same through the second opening, a cylindrical sleeve forming a part of the body and located between said openings in alignment with the shuttle assembly, the sleeve having an internal diameter greater than the diameter of the sphere, said plunger being disposed within said sleeve when the shuttle assembly is in said first sphere launching position, resilient sealing means carried by the plunger and forming a seal between the plunger and the sleeve when the assembly is in said sphere launching position, and a flow restricting member at that portion of the sphere carrier which is remote from the plunger to prevent backflow through the sleeve, said member being disposed within said sleeve when said assembly is in its second sphere receiving position, the sleeve being dimensioned whereby for a substantial distance of movement of the shuttle assembly before reaching sphere launching position said sealing means maintains sealing contact with the sleeve, thereby providing a fluid seal between the first and second body spaces.

3,911,725
METHOD OF OPERATING LIFE TESTING HYDRAULIC UNITS WITH LINEAR-MOTION OUTPUT MEMBER

Mikhail Prokhorovich Selivanov, Leningradskoe shosse, 49-51, korpus 1, kv. 38; Vladimir Genrikhovich Neiman, Petrozavodskaya ulitsa, 15, korpus 1, kv. 103; Jury Viktorovich Tochilin, 3 Vladimirovskaya ulitsa, 20, kv. 15; Boris Vitalievich Shamro, ulitsa Osipenko, 15/16, kv. 7, and Valentin Ivanovich Panin, Volgogradsky prospekt, 158, korpus 1, kv. 23, all of Moscow, U.S.S.R.

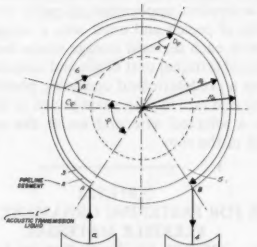
Filed Aug. 28, 1974, Ser. No. 501,287
Int. Cl.² G01M 13/00, 19/00
U.S. Cl. 73—15.4 6 Claims

1. A method of operating life testing hydraulic units with linear-motion output member comprising the steps of establishing the delivery pressure and temperature of working liquid maximum admissible for the unit being tested; feeding to said unit being tested of a control pulse imparting to the output member of said unit a cyclical reciprocatory motion with the amplitude and frequency which are constant during said tests and correspond to maximum available velocity of said unit being tested; applying an external load to the output member of said unit which is determined on the basis of the equivalent accumulation of the fatigue damages in load-bearing members of said unit; operating with a number of cycles of said reciprocations of the output member for a testing time, the number of cycles and the testing time being determined on the basis of the equivalent wear of seals of said unit; with subsequent ageing of said unit under non-operating conditions for a time which is determined on the basis of the equivalent ageing of seals of said unit being tested.

3,911,726
ULTRASONIC METHOD FOR MEASURING OF PARAMETERS OF LIQUIDS

Georgi Iliev Georgiev, Sofia, Bulgaria, assignor to VMGI, Sofia, Bulgaria

Filed Mar. 20, 1973, Ser. No. 343,006
Int. Cl.² G01N 9/24, 29/02
U.S. Cl. 73—32 A 1 Claim



1. A method of instantaneously measuring a parameter of a liquid traversing a cylindrical pipeline, comprising the steps of: training an ultrasonic wave against an external wall of said pipeline in an offradial direction to generate an elastic wave in the wall thereof, whereby longitudinal ultrasonic waves are transmitted through the fluid to another point of the same wall; detecting a longitudinal wave emitted from the external wall of said pipeline at another point therealong in the same plane as that at which the ultrasonic wave was trained on said

pipeline and at a point circumferentially spaced therefrom at the same angle to the radius at which the ultrasonic wave was trained on said wall; generating electrical signals representing the initial ultrasonic wave and the detected ultrasonic wave; and comparing the phases of said signals to obtain an evaluation of said parameter.

3,911,727
THERMAL LEAK DETECTOR FOR A HEAT-INSULATION-LINED TANK FOR LOW-TEMPERATURE LIQUIDS

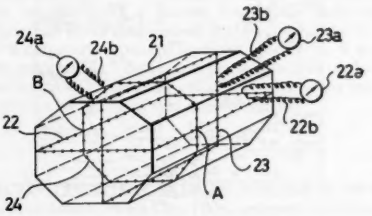
Kihei Katsuta; Nobuya Watanabe, both of Nagasaki, and Chiaki Matsuyama, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,217

Claims priority, application Japan, Mar. 2, 1973, 48-25298; Mar. 3, 1973, 48-25444; Mar. 28, 1973, 48-35296

Int. Cl.² G01M *3/00*; G01K *7/00*; G01N *25/18*

U.S. Cl. 73—49.2 **9 Claims**



1. A storage tank for low-temperature liquids comprising:
a tank shell;
a liquid-impervious layer secured on the inside of the tank shell;
a heat-insulation layer being provided between said tank shell and said liquid-impervious layer;
a fluid-tight barrier portion being provided within said heat-insulation layer, said barrier portion including an electric insulation layer and temperature sensing members embedded in said layer, said temperature sensing members being interconnected by electrical conductors so as to form a lattice network; and
indicating means connected to a plurality of lattice intersections and responsive to a change in an electrical circuit parameter for indicating local temperature as a result of a leak in said liquid-impervious layer.

3,911,728
COAGULATION DETECTION APPARATUS

Marcel Joseph Fixot, L'Hermitage, France, assignor to Etablissements Daillet S.A., Rennes, France

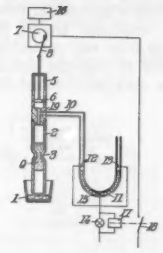
Filed Feb. 7, 1974, Ser. No. 440,282

Claims priority, application France, Feb. 19, 1973, 73.05788

Int. Cl.² G01N *11/04*

U.S. Cl. 73—55 **12 Claims**

1. A process for detecting sudden and substantial increases in fluid viscosity comprising the steps of:
a. placing a sample of a fluid under test and a confined gas in a tube having a narrow cross-section;
b. reciprocally moving said fluid through said narrow cross-section and thereby alternately compressing and expanding said confined gas;
c. detecting the gas pressure variations, on one side of said sample, resulting from said alternate compression and expansion of said gas; and
d. giving an output signal responsive to a pressure change which is substantially greater than the variations occurring responsive to said alternate compression and expansion.



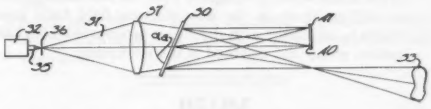
3,911,729
SHEAR WAVE ACOUSTICAL HOLOGRAPHY

H. Dale Collins, Richland, Wash., assignor to Holosonics, Inc., Richland, Wash.

Filed July 16, 1973, Ser. No. 379,344

Int. Cl.² G03H *3/00*

U.S. Cl. 73—67.5 H **9 Claims**



1. In a method of producing holographic information of an object located in a volume of solid material having an exterior surface;
insonifying the volume with acoustical wave energy to produce an object modified beam of acoustical wave energy containing shear waves;
scanning the volume with a focused acoustical transducer directed toward the exterior surface at an angle of incidence thereto to receive only the shear wave energy of the object modified beam;
producing a shear wave hologram of the object from the received shear wave radiation of the object modified beam;
illuminating the shear wave hologram with a beam of coherent light to produce an optical image of the object; and
tilting the hologram at an acute angle with respect to the light beam to reduce image aberrations.

3,911,730
ULTRASONIC TRANSDUCER PROBE SYSTEM

Ludwig Niklas, Lovenich, Germany, assignor to Krautkramer-Branson, Incorporated, Stamford, Conn.

Filed June 28, 1974, Ser. No. 483,941

Claims priority, application Germany, Sept. 7, 1973, 2345155

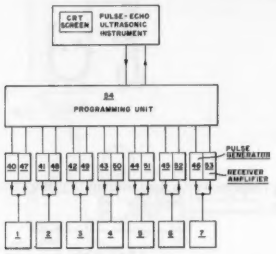
Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.7 **17 Claims**

1. A transducer system for ultrasonic testing comprising:
a linear array of ultrasonic transducer probes adapted to be coupled to the surface of a workpiece for transmitting ultrasonic sound waves into a workpiece and for receiving ultrasonic waves reflected therefrom;
electrical pulse generating means for providing electrical high frequency pulses to probes coupled to said generating means;

receiving means for receiving and displaying signals responsive to reflected ultrasonic waves received by said probes, and

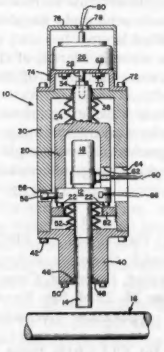
means coupling said generating means and receiving means to a central group of juxtaposed probes selected from said array and to additional groups of juxtaposed probes spaced laterally from said central group for causing the probes coupled to transmit simultaneously ultrasonic waves into the workpiece and to receive reflected ultrasonic waves therefrom arising from an acoustic discontinuity, and to provide signals responsive to the received waves to said receiving means, the width comprising a respective group of probes and the lateral spacing of each group from said central group along the axis of said array being selected to cause the respective acoustic pressures of the sound waves propagated from the individual probes to add positively in the acoustic near-field focal zone which is associated with the waves propagated from said central group and disposed in the workpiece.



3,911,731
NON-CONTACTING SELF-CALIBRATING VIBRATION SENSOR

Duncan N. Walker, Jonesville, and Matthew A. Kazlauskas, Pattersonville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,505
Int. Cl.² G01M *1/22*; G01H *11/00*
U.S. Cl. 73—71.4 **10 Claims**



1. A non-contacting, self-calibrating vibration sensor comprising:

first means for producing a first output signal representative of the instantaneous displacement between said sensor and an object;

second means for vibrating said first means at a predetermined freguency and amplitude;

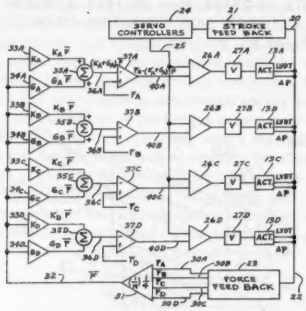
third means, comprising an accelerometer and an integrating and filtering network connected to receive a signal from said accelerometer, for producing a second output signal representative of the frequency and amplitude of displacement of said first means;

electrical means for combining said first and second output signals to produce a resultant output signal representative only of the frequency and amplitude of displacement of said object.

3,911,732
OFF CENTER LOADING COMPENSATION FOR MULTIPLE ACTUATOR VIBRATION TABLE

Rodney L. Larson, Minnetonka, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed July 29, 1974, Ser. No. 492,452
Int. Cl.² G01N *29/00*
U.S. Cl. 73—71.6 **8 Claims**



1. A test apparatus comprising a plurality of displacement generating actuators for displacing a test structure for movement in a vibratory path, said structure having at least one axis about which the displacement of the structure is to be controlled, and said structure having a center of mass offset from said one axis, at least some of said plurality of actuators also acting at points spaced from said one axis, means to control said actuators for reciprocating movement in their desired vibratory path, including means connected to each actuator to provide separate signals indicating force applied to said structure by that actuator, means to provide a signal indicating the average force actually applied to said test structure by said actuators, means to separately modify said average force signal for each of said some actuators by a factor which is a function of the distance said center of mass is offset from said axis and the distance that each of said some actuators is from said axis with respect to the distance from said axis of the other of said some actuators, and means to compare the individual force exerted by each of said some actuators with the separately modified average force signal for that actuator to provide a force balance signal in said means to control representing the difference between the force actually applied to the structure by that actuator and the separately modified average force signal for that actuator.

3,911,733
OPTICAL SIGNATURE METHOD AND APPARATUS FOR STRUCTURAL INTEGRITY VERIFICATION

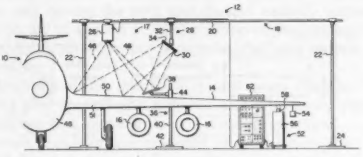
Pravin G. Bhuta; David A. Evensen, both of Torrance, and Edmund K. Burchman, Los Alamitos, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 1, 1974, Ser. No. 456,998
Int. Cl.² G01N *3/32*
U.S. Cl. 73—88 A **22 Claims**

1. The method of nondestructively evaluating the structural integrity of a load bearing structure comprising the steps of: recording on a first holographic recording medium a first hologram of said structure while the latter is in a first stress condition and a second hologram of said structure while the

latter is in a second stress condition to produce a first holographic interferogram for reconstructing a first holographic deformation pattern of the structure; and

thereafter recording on a second holographic recording medium a first hologram of said structure while the latter is in said first stress condition and a second hologram of said structure while the latter is in said second stress



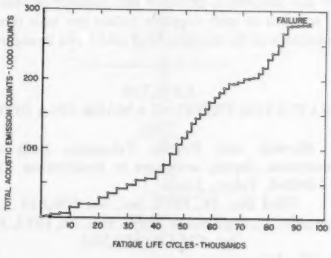
condition to produce a second holographic interferogram for reconstructing a second holographic deformation pattern of the structure which may be compared with said first deformation pattern to detect differences, if any, in the patterns, such differences being indicative of changes in the structural integrity of said structure in the interval between recording of said interferograms.

3,911,734

DETECTING INCIPIENT FATIGUE DAMAGE IN METAL

Parviz Mehdizadeh, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 4, 1974, Ser. No. 430,862
Int. Cl.² G01N *3/32*
U.S. Cl. 73—91 **1 Claim**



1. A method of detecting incipient fatigue damage in a metal specimen subjected to repeated fatigue life cycles during the service of said metal specimen comprising:

a. removing the metal specimen from service;

b. applying a tension load to the specimen at least equal to the load the specimen receives in service;

c. determining the total number of acoustic emissions produced during said loading;

d. removing the tension load from the specimen and returning the specimen to service;

e. repeating steps (*a*) through (*d*) until a plot of acoustic emissions versus fatigue life cycles indicates incipient fatigue damage in the specimen; and

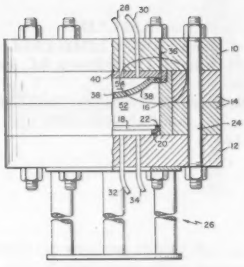
f. permanently removing the specimen from service prior to the development of a detectable fatigue crack therein.

3,911,735

PRESSURE TEST VESSEL WHICH ALLOWS UNRESTRAINED FLEXING OF SPHERICAL SEGMENT TEST SPECIMEN

Joseph S. Di Crispino, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1974, Ser. No. 448,314
Int. Cl.² G01N *3/12*
U.S. Cl. 73—102 **7 Claims**



1. A device for pressure testing segments of hollow spherical bodies, comprising:

a vessel designed to withstand internal pressurization, said vessel having an end plate against which said segments rest;

a hip on said end plate against which said segments rest; and

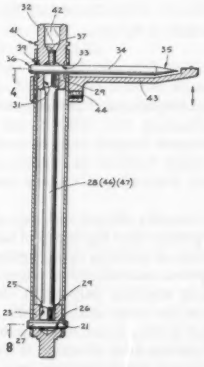
means for maintaining a pressure differential across said segments.

3,911,736

MULTIPLE RANGE TORQUE MEASURING TOOL

Arthur Miller, 1602 Myrtlewood St., Costa Mesa, Calif. 92626

Filed May 22, 1974, Ser. No. 472,159
Int. Cl.² B25B *23/14*
U.S. Cl. 73—139 **11 Claims**



1. A torque measuring tool comprising:

a. a torsion element with tool receiving means at one end and wrench receiving means at the opposite end;

b. a torsion tube coaxial with and surrounding said torsion element, one end of said torsion tube being affixed to said tool receiving means of said torsion element;

c. means limiting relative angular displacement between said wrench receiving means of said torsion element and said torsion tube, said limiting means including an indicating element driveable by said torsion element and a

stop fixed to said torsion tube and engageable with said indicating element;

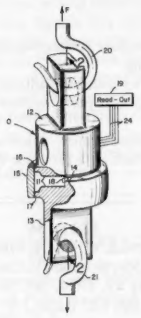
d. a scale carrier with a scale having indicia thereon cooperable with said indicating element to provide an indication of the applied torque, said scale carrier being rotatably and slidably mounted on said torsion tube; and

e. means to affix said scale carrier to said torsion tube in an infinite number of positions, angular and axial, relative to said torsion tube and to said indicating element.

3,911,737
HEAVY DUTY LOAD CELL

Alfred Newman Ormond, 11969 Rivera Rd., Santa Fe Springs, Calif. 90670

Filed June 27, 1974, Ser. No. 483,609
Int. Cl.² G01L *1/22*
U.S. Cl. 73—141 A **6 Claims**



1. A heavy duty load cell for measuring axial loads comprising, in combination:

a. an elongated integral body member having a circumferential recess between its opposite end portions leaving a centrally disposed axial column connecting said end portion;

b. a ring coaxially aligned with said column and of an axial length greater than the width of said recess, the opposite inner ends of said ring being rigidly secured over 360° to the opposed circumferential edges of said end portions of said body member defined by the circumferential entrance of the recess said centrally disposed axial column being pre-loaded in one direction by pre-loading said ring in an opposite axial direction at the time it is secured to said opposed circumferential end portions of said body member; and,

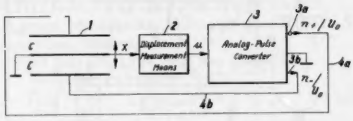
c. strain gauge means secured to opposite sides of the central portion of said column for connection to a read out device

whereby the major portion of an axial load applied to said opposite end portions of said body is borne by said ring, extraneous torsion bending and side load components being absorbed by said ring so that strains developed in said centrally disposed axial column are a function of only the load in an axial direction to thereby provide a consistent and accurate read out of the axial load.

3,911,738
LINEARIZED FORCE MEASURING APPARATUS

Hans Werner Fischer, Am Moenchsrain 25, D-692 Sinsheim, Germany

Filed May 17, 1974, Ser. No. 471,030
Claims priority, application Germany, May 23, 1973, 2326233
Int. Cl.² G01L *5/00*
U.S. Cl. 73—141 R **9 Claims**

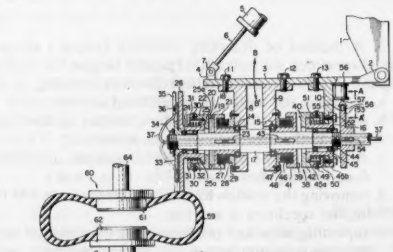


1. Linearized force measuring apparatus, comprising, in combination, a differential capacitor having a first plate, a second plate mounted parallel to said first plate in a reference position at a predetermined distance from said first plate and adapted to move in the direction perpendicular to said first plate under action of the force being measured, a third plate mounted in a fixed position parallel to said second plate at said predetermined distance therefrom on the side away from said first plate; displacement measuring means connected to said capacitor for furnishing a displacement signal having an amplitude varying as a function of displacement of said second plate from said reference position; analog/pulse converter means connected to said displacement measuring means and having a first and second converter output, for furnishing a sequence of positive pulses and a sequence of negative pulses at said first and second converter outputs respectively, the difference between the number of said positive and the number of said negative pulses per unit time varying as a function of said amplitude of said displacement signal, the total number of pulses per unit time remaining constant; and connecting means for connecting said converter output to said capacitor in such a manner that the electric force on said second plate created by said pulses opposes said force being measured, whereby the difference between the number of said positive and the number of said negative pulses per unit time constitutes a measure of the amplitude of said force being measured.

3,911,739
APPARATUS FOR PRINTING A MARK ON A ROTATING TIRE

Junichi Murata, and Yutaka Takasuga, both of Higashimurayama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,616
Claims priority, application Japan, Dec. 28, 1973, 49-2645
Int. Cl.² G01M *17/02*
U.S. Cl. 73—146 **9 Claims**



1. An apparatus for printing a mark on a rotating vehicle

tire under uniformity test by a uniformity measuring device, said apparatus comprising:

a rotary shaft rotatably supported on a bracket;

a first disc member securely mounted at one end of said rotary shaft for rotation therewith;

a second disc member freely rotatably mounted on said rotary shaft inwardly of said first disc member and adapted to be brought into pressing contact with a tire under measurement;

a marking means securely mounted on said first disc member and having the fore end thereof radially outwardly projected to assume a radial position corresponding to or slightly beyond the outer periphery of said second disc member;

a first clutch means mounted on said rotary shaft for coupling said second disc member and said rotary shaft in response to a signal from said measuring device;

a second clutch means mounted on said rotary shaft and said bracket for coupling said rotary shaft and said bracket when said marking means returns to a stand-by position on said first disc member; and

a positioning means for holding said marking means in said stand-by position.

3,911,740

METHOD OF AND APPARATUS FOR MEASURING PROPERTIES OF DRILLING MUD IN AN UNDERWATER WELL

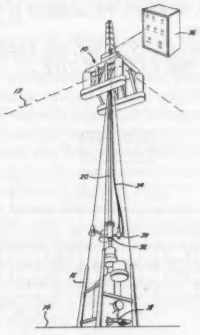
Charles W. Calhoun, Houston, Tex., assignor to C. Jim Stewart & Stevenson, Inc., Houston, Tex.

Filed Mar. 29, 1974, Ser. No. 456,400

Claims priority, application United Kingdom, June 21, 1973, 29529/73

Int. Cl.² E21B *47/06*

U.S. Cl. 73—153 **8 Claims**



3. A method of measuring properties of drilling mud in an underwater well in which the mud flows downward through a drilling string and up the annulus between the drilling string and a riser pipe comprising,

collecting at a point underwater in a closed container a sample of the mud from the annulus under ambient conditions,

expanding the container to an amount to reduce the pressure therein to atmospheric pressure, and

measuring the weight of the mud in the container and transmitting signals to the water surface resulting from the weight measurement.

3,911,741

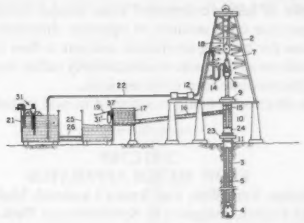
PNEUMATIC FLUID WEIGHING DEVICE

Robert W. Rochon, 4436 Blanco Road, San Antonio, Tex. 78212, and Joseph W. Sneed, Jr., 5706 Ben Casey, San Antonio, Tex. 78240

Continuation of Ser. No. 324,099, Jan. 16, 1973, abandoned. This application May 14, 1974, Ser. No. 469,876

Int. Cl.² E21B *47/00*

U.S. Cl. 73—153 **6 Claims**



1. An apparatus for weighing drilling fluid at a shaker box comprising a pair of pneumatic tubes mounted in parallel relationship, each of said tubes being open at one end and communicating with a source of pressurized air at the other end said open end of one tube being vertically spaced a predetermined distance from the end of the other tube, control means for delivering and maintaining a constant and equal rate of air flow to each of said tubes, housing surrounding said pneumatic tubes with an inlet opening in the side of said housing for receiving said drilling fluid from an opening in the side of said shaker box, discharge opening in the bottom of said housing, said discharge opening being smaller than said inlet opening to maintain a level of said drilling fluid in said housing substantially equal to the level in said shaker box, flow of said drilling fluid through said housing means being over the open ends of said pneumatic tubes immersed in said drilling fluid.

3,911,742

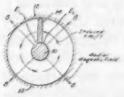
RADIAL FIELD ELECTROMAGNETIC FLOW METER

Alexander Kolin, Bel Air, Calif., assignor to Regents, University of California, Berkeley, Calif.

Continuation of Ser. No. 232,500, March 7, 1972, which is a continuation of Ser. No. 34,214, May 4, 1970, abandoned. This application Mar. 16, 1973, Ser. No. 341,825

Int. Cl. G01f *1/00*

U.S.-Cl. 73—194 EM **2 Claims**



1. An electromagnetic flow meter for measuring flow of liquid in a conduit, comprising:

magnetic means for creating a magnetic field within the conduit having a substantial radial component extending across the conduit with respect to the central axis of said magnetic means, so as to produce tangential electromotive forces in the flowing liquid;

dielectric septum means mounted adjacent said magnetic means and extending radially across the conduit from the central axis thereof to block the flow of electrical eddy

currents in the liquid induced by said electromotive forces;

first and second electrodes mounted adjacent said magnetic means on opposite sides of said septum means in contact with the liquid, for exhibiting an electromotive force which is a measure of the velocity of the liquid in the conduit;

said magnetic means including:

a pair of spaced elongate magnetic core sections extending parallel to the central axis of the conduit;

a pair of series-connected coils wound around said respective core sections in opposite directions; and

means for causing an electric current to flow through said coils so as to create a substantially radial magnetic field intermediate said core sections,

said electrodes being positioned in said radial field.

3,911,743

FLOW METER APPARATUS

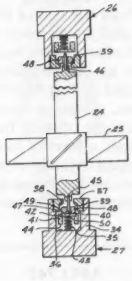
Yves Nicolas, Versailles, and Andre Landaud, Maisons Alfort, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,734

Claims priority, application France, Feb. 9, 1973, 73.04669

Int. Cl.² G01F *15/00*

U.S. Cl. 73—229 **22 Claims**



1. A flow meter comprising, a support, a rotor having an axis and mounted for rotation relative to the support, means for improving the accuracy of the flow meter and comprising, a rigid ring generally concentric with the rotor axis and between a surface of revolution of the rotor and a surface of revolution spaced from the rotor and carried by the support, the ring having a radial thickness less than the space between the surfaces so that the ring is normally out of engagement with the rotor surface and stationary with respect to one of the surfaces, but can move transversely to engage both surfaces and can rotate with respect to both the surfaces, in response to radial displacement of the rotor surface caused by rotor vibration, and wherein the surface of the rotor and the surface of the ring facing the surface of the rotor form a pair of surfaces, the surface carried by the support and the surface of the ring facing the surface carried by the support form another pair of surfaces, and one surface of each of said pair of surfaces is convex.

3,911,744

LIQUID LEVEL GAUGING APPARATUS

Harrison F. Edwards, Norwich, N.Y., assignor to Liquidometer Corporation, Norwich, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,574

Int. Cl.² G01F *23/24*

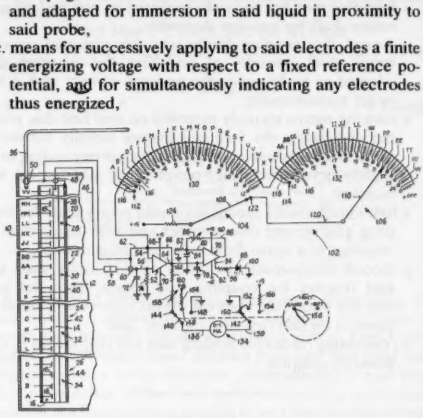
U.S. Cl. 73—304 R **34 Claims**

1. A liquid-level gauge comprising, in combination:

a. an upright conducting probe adapted for contact at a multiplicity of levels with the liquid to be gauged,

b. an upright row of electrodes insulated from each other and adapted for immersion in said liquid in proximity to said probe,

c. means for successively applying to said electrodes a finite energizing voltage with respect to a fixed reference potential, and for simultaneously indicating any electrodes thus energized,



d. voltage responsive detector means having a voltage sensitive input terminal connected to said probe for sensing potential therefrom as the energizing voltage is applied to the electrodes, said detector means providing an indicating output signal in response to energization of an electrode which is at least partially submerged in the liquid, and

e. means for maintaining any electrodes which are not energized by the energizing voltage at a potential substantially equal to the potential of the conducting probe.

3,911,745

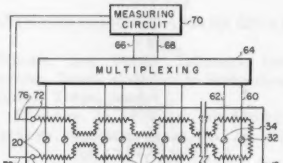
RESISTANCE REFERENCE JUNCTION COMPENSATOR

William K. Erhardt, Richboro, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1974, Ser. No. 532,475

Int. Cl.² G01K *7/12*

U.S. Cl. 73—341 **6 Claims**

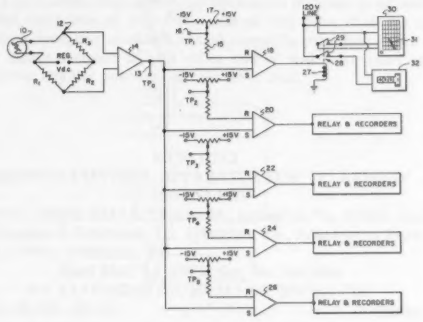


1. A resistance reference junction compensator for a multithermocouple activated temperature measuring circuit, comprising a non-conductive substrate and an isothermal panel, said isothermal panel having means therein to provide separate terminals for each of a plurality of thermocouples, said substrate and panel having flat areas that are substantially equal and mounted in surface-to-surface engagement with one another, said substrate having a temperature sensitive reference resistor formed on said flat contacting surface thereof, said resistor being distributed over substantially all of said surface of said substrate and interspersed about said terminals, whereby said resistor responds to temperature changes when the temperature of one or several of said terminals are altered by a change in ambient temperature.

3,911,746
TIME AND CONDITION DATA LOGGER

Ayers M. Spangler, Bladensburg, and Luigi A. Vagnoni, Hyattsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 174,347, Aug. 24, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,102
Int. Cl.[2] G01D *7/00*
U.S. Cl. 73—343.5 **8 Claims**



1. An apparatus for linearly producing a record of time versus a series of events profile comprising:

event detector means positionable in an environment to be monitored for producing a first output signal indicative of said event;

a Wheatstone bridge circuit connected to said event detector means, said event detector means forming an arm thereof;

amplifier means connected to said Wheatstone bridge for producing a second output signal in response to said first output signal;

a plurality adjustable voltage source means for producing a plurality of variable reference voltages;

a plurality of comparator means for comparing said second output signal produced by said amplifier means and said plurality of variable reference voltages to produce one or more third output signals whenever said second output signal exceeds any of said plurality of reference voltages; a plurality of switching means connected to and activated by said third output signals; and

multichannel event recording means connected to and activated by said switching means for recording an elapsed time of said series of events indicated by said plurality of switching means in a series of linear steps irrespective of the nonlinearity of said event detector means to produce a linear measurement of time versus said series of events profile.

3,911,747
THERMAL WELD MONITORING DEVICE

Robert B. Sivyer, P.O. Box 19023, Houston, Tex. 77024

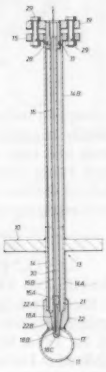
Filed Nov. 9, 1973, Ser. No. 414,229
Int. Cl.[2] G01K *1/08*
U.S. Cl. 73—343 R **5 Claims**

1. A temperature monitoring system for use in a coil in a furnace where fluid passed through the coil is heated in the furnace to high temperatures including:

a tubular outer assembly including at one end a fitting member adapted for welding connection to a furnace coil and at its opposite end a first coupling member adapted to be disposed exterior to a furnace wall, said tubular outer assembly including an interior conically tapered sealing surface in said fitting member,

a tubular inner assembly including terminal sensor means sized for passage through said outer assembly and an adjoining exterior, conically tapered sealing surface, said exterior and interior sealing surfaces being complementarily formed, said exterior sealing surface being longitudinally spaced from said terminal sensor means so that when said sealing surfaces are in sealing engagement, said terminal sensor means are disposed within the interior of a coil,

said sensor means having a portion thereof which is undersized relative to the cross section of the exit opening of



said fitting member for accomodating a residue build-up within a coil without hindering removal of said sensor means from said fitting member, said sensor means having a spherically formed terminal portion, said fitting member having adjoining bevelled and tapered end surfaces for enhancement of the weld penetration relative to a furnace coil, and

coupling means on said inner and outer assemblies and longitudinally spaced from said sealing surfaces so that said coupling means are locatable exterior to a furnace, said coupling means being cooperable for maintaining said sealing surfaces in a sealing relationship.

3,911,748
COIL FOR PRESSURE GAUGE

James E. Lindsay, 24712 Enerene Circle, El Toro, Calif. 92630

Continuation of Ser. No. 225,891, Feb. 14, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,865
Int. Cl. G01l *7/04*
U.S. Cl. 73—418 **4 Claims**

1. In a pressure sensor, the combination of:

a. a housing;

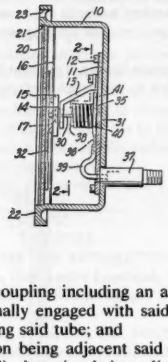
b. a one-piece Bourdon tube in said housing comprising a flat spiral section with a plurality of turns having a common transverse central plane, and a coaxial cylindrical helical section with a plurality of turns, said spiral and helical sections providing said tube with a T-shaped configuration in a longitudinal plane containing the axis of said sections;

c. a fitting carried in said housing for connection to a pressure source, with one end of said tube connected to said fitting and with the other end closed;

d. a pressure indicating means in said housing;

e. means for coupling said tube adjacent said closed end to said pressure indicating means;

f. said pressure indicating means having a rotating shaft mounted in said housing and coaxial with said spiral and helical sections of said tube;



g. said means for coupling including an arm fixed to said shaft and frictionally engaged with said tube, with said arm movable along said tube; and

h. said spiral section being adjacent said one end of said tube and said helical section being adjacent said closed end, with said arm engaging said helical section.

3,911,749

SAMPLING PROBES

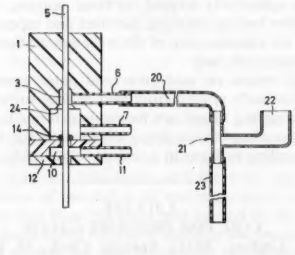
Robert John Hendry, Rayleigh, England, assignor to ChemLab Manufacturing Limited, London, England

Filed Oct. 15, 1974, Ser. No. 514,510

Claims priority, application United Kingdom, Oct. 16, 1973, 48116/73; Feb. 7, 1974, 5710/74

Int. Cl.² G01N 1/14

U.S. Cl. 73—423 A **8 Claims**



1. In a sampling probe of the type comprising a small bore cannula intended to have a suction applied at one end and to have the other end dipped alternately into a sample cup and into a wash container filled with water or other cleaning medium so that sample and cleaning medium are drawn alternately through the cannula: the improvement that the wash container is in the form of a reservoir chamber having an inlet for washing liquid and opposed upper and lower outlets, the cannula extending through the upper outlet and being axially reciprocable between a wash position in which its lower end is within the reservoir chamber and a sample position in which the lower end extends through the lower outlet so as to extend into a sample cup when such is located below the said lower outlet, a sealing member being carried by the cannula to seal the upper outlet in the wash position and the lower outlet in the sample position of the cannula, and a suction zone being provided below the lower outlet adapted to be connected to a source of vacuum to prevent washing liquid passing from the lower outlet into a sample cup below the lower outlet.

3,911,750

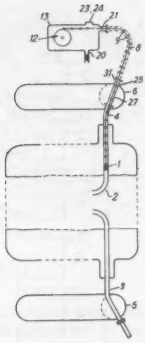
APPARATUS FOR THE INTERNAL INSPECTION OF TUBULAR CONDUITS

Charles Lindsay Prasher, Croydon, England, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,183

Int. Cl.² G01N 29/04

U.S. Cl. 73—432 R **8 Claims**



1. Apparatus for the internal inspection of a tubular conduit comprising a source of pressurized fluid, and including a probe, electrical leads connecting the probe with a monitoring instrument, a plurality of spaced pistons threaded onto said leads and securely fixed relative thereto, the probe and pistons being sized to slide freely within said conduit, means for inserting the probe and at least one piston into one end of said conduit and for admitting pressurized fluid to said end to urge the probe and piston along said conduit.

3,911,751

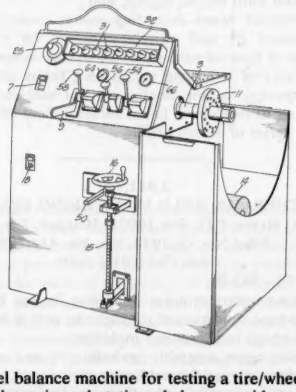
WHEEL BALANCE MACHINE

Donald H. Shooter, and Otto F. Colbert, both of 7913 Chatfield Ave., Whittier, Calif. 90605

Continuation-in-part of Ser. No. 295,158, Oct. 5, 1972. This application Jan. 11, 1974, Ser. No. 432,461

Int. Cl.² G01M 1/16

U.S. Cl. 73—464 **4 Claims**



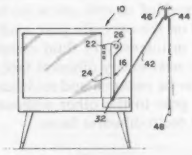
1. A wheel balance machine for testing a tire/wheel combination for dynamic and static unbalances, said machine including: a frame; a drive shaft; a first bearing rotatably mounting one end of said drive shaft to said frame; a drive motor; means coupling said drive motor to said drive shaft; a hub

mounted at one end of said drive shaft adjacent said first bearing for supporting a tire/wheel combination for rotation by said shaft about the axis of rotation of said shaft; a second bearing rotatably mounting the other end of said shaft to said frame and adjustable to permit radial deflection of said other end of said shaft upon rotation of said shaft in the presence of dynamic unbalance of said tire/wheel combination, said second bearing means including a pneumatic member and means for introducing pressurized fluid into said pneumatic member for causing said second bearing to hold the other end of said drive shaft on the axis of rotation of said drive shaft for one operating condition of said second bearing, and for releasing said pressurized fluid from said pneumatic member to permit radial deflection of said other end of said drive shaft for a second operating condition of said second bearing; and indicator means coupled to said other end of said drive shaft to indicate angular positions of said drive shaft.

3,911,752
REMOTE CONTROL APPARATUS FOR TELEVISION RECEIVERS

Joyce L. Olson, 1219 S. Thomas St., Arlington, Va. 22204, and Stephen A. Lazorcak, Jr., Arlington, Va., assignors to Joyce L. Olson, Arlington, Va.

Filed Mar. 13, 1974, Ser. No. 450,686
Int. Cl.² F16D *41/00;* **H03J** *1/00;* **H01H** *17/08*
U.S. Cl. 74—10 A **7 Claims**



1. Remote control apparatus for actuating the channel selector of a television receiver having a channel selector shaft, said apparatus including:

a. control means mounted on, and rotatable with, the channel selector shaft,

b. a circular member axially mounted on, and rotatable with, said control means,

c. the outer periphery of said circular member having a plurality of first locking elements,

d. a lever arm, one end of which is enlarged and provided with an elongated slot,

e. a second locking element extending from a face of the enlarged end of said lever arm and selectively engageable with the first locking elements of said circular member, for rotating said circular member, control means and channel selector shaft upon rotation of said lever arm in an arc,

f. stationary means above said lever arm, and

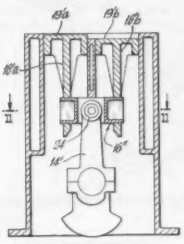
g. flexible means, one end of which is attached to the free end of said lever arm,

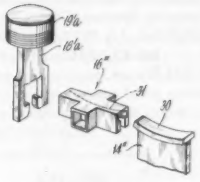
h. said flexible means extending through said stationary means and the other end thereof being held by the viewer, for rotating the lever arm in an arc upon force being exerted on said flexible means.

3,911,753
CONNECTING ROD AND CONNECTING ROD SYSTEMS FOR INTERNAL COMBUSTION ENGINE AND COMPRESSORS AND PARTITIONED CYLINDER FOR INTERNAL COMBUSTION ENGINE

Rudolph Daub, 9 Hickory Drive, North Caldwell, N.J. 07006

Filed Aug. 17, 1973, Ser. No. 389,286
Int. Cl. F16h *21/32*
U.S. Cl. 74—40 **14 Claims**





1. In an engine or a compressor having an inverted U-cylinder, each arm of the U forming a respective cylinder and the remainder of the U communicating with the respective cylinders and forming a common compression chamber for the respective cylinders, a respective piston slidably received in each of the respective cylinders for reciprocation therein, a crank shaft and a crank pin mounted on the crank shaft, the axes of said respective cylinders lying in a common plane and the respective axes of the crank shaft and the crank pin being substantially perpendicular to the common plane, the improvement comprising a main connecting rod one end of which is connected to the crank pin, a cross head, means mounting the cross head for reciprocation parallel to the axes of the respective cylinders and in the common plane, the other end of the main connecting rod being connected to the cross head, and first and second auxiliary connecting rods each rigidly connected to a respective one of said pistons and each hingedly connected to said cross head.

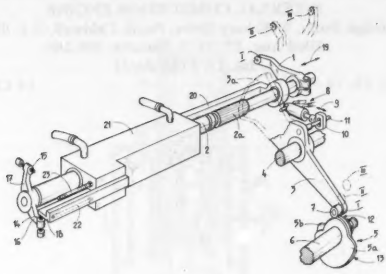
3,911,754
CONTROL DEVICE OF AN OSCILLATING ELEMENT OF A MACHINE-TOOL

Yves-Michel Pitto, Geneva, Switzerland, assignor to Tarex-Manurhin S.A. Fabrique de Machines, Geneva, Switzerland

Filed Feb. 1, 1974, Ser. No. 438,787
Claims priority, application Switzerland, Feb. 7, 1973, 1720/73
Int. Cl.² F16H *25/14*
U.S. Cl. 74—102 **3 Claims**

1. A control device for an oscillating element of a machine tool, such as a loading arm, which has to occupy at least three angular positions, including in combination, a cam having first and second portions thereon, said cam being coupled to said element for moving same into two of said angular positions,

piston means coupled to said element for maintaining said element against said cam portions when in said two positions,

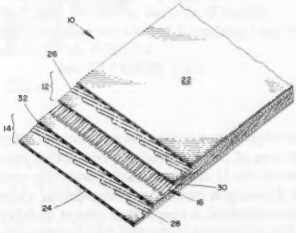


and for moving said element away from said cam to said third position.

3,911,755
FLAT BELT

James C. Vance, Sr., Sedalia, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 17, 1974, Ser. No. 515,728
Int. Cl.² F16G *1/00, 1/26*
U.S. Cl. 74—231 R **7 Claims**



1. A flexible power transmission generally flat belt capable of driving from opposite portions thereof to transmit power between pulleys, the belt comprising:

a flat layer of flexible resilient material extending longitudinally of the belt to define a first driving portion thereof and including a plurality of substantially uniformly spaced cross-cords embedded therein and transversely disposed at a first angle in relation to the longitudinal axis of the belt;

a second layer of flexible material spaced from, substantially parallel with, and having a thickness substantially equal to the first layer to define a second driving portion oppositely facing from the first driving portion and including a plurality of substantially uniformly spaced cross-cords embedded therein and transversely disposed at substantially the first angle from the transverse axis of the belt;

a tensile section of high modulus material embedded in the belt between the first and second layers, the tensile section including at least two oppositely twisted cords spiralled side-by-side at a second angle in relation to the longitudinal axis of the belt, the first and second angles oppositely facing from each other;

the two oppositely twisted cords substantially balancing each others intrinsic torque from cord twist when tensioned, and the cross-cords substantially balancing the intrinsic tracking affect of the spiralled cords at the first and second driving portions.

3,911,756
APPARATUS TO SUPPRESS NOISE IN GEARING

Rene D. Colinet, Philadelphia, Pa., assignor to Industrial Research Laboratory Inc., Philadelphia, Pa.

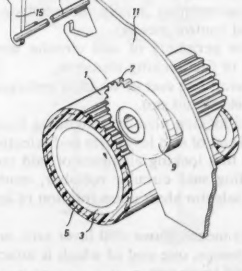
Filed Jan. 9, 1974, Ser. No. 432,072
Int. Cl.² F16H *55/18, 57/00, 57/04*
U.S. Cl. 74—410 **3 Claims**

1. In a pair of meshing gears consisting in one first inner gear having an axis of rotation and having dihedral external teeth, located inside a second outer gear having another distinct axis of rotation parallel to the axis of rotation of the first inner gear and having dihedral internal teeth, the introduction in the gaps between meshing teeth of a field of repulsion forces provided by a compressible fluid entrapped in the zone of deepest mutual penetration of meshing teeth, said zone being defined by sliding contacts between tips and cavities of mating teeth, and by external flat rings closing the ends of all teeth in the said zone, with each zone enclosing a variable volume when the tips are allowed to slide against the cavities, the latter being profiled as cylindrical surfaces touching the tips and centered on the opposite gear, said field of repulsion forces increasing in intensity of fluid compression when the tips approach the next cavity dihedral faces causing the volume of the zone to be reduced and said fluid transferring the torque from one gear to the other without metallic contact between adjacent teeth dihedral faces.

3,911,757
FINE-TOOTHED GEAR PAIR

Albert Rix; Hans Fuchs; Rolf Moritz, and Jens Onuscheit, all of Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Oct. 11, 1974, Ser. No. 514,280
Claims priority, application Germany, Oct. 15, 1973, 2351603
Int. Cl.² F16H *55/04*
U.S. Cl. 74—437 **3 Claims**



1. In a fine-toothed gear pair formed of a continuously rotated driving member having elastic teeth about its circumference and a driven member having a series of elastic teeth along a portion of its circumference, the spacing between the teeth of the driving member being larger than the spacing

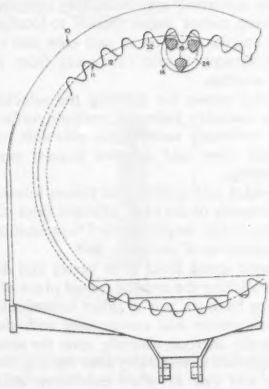
between the teeth of the driven member, the elasticity of the material of the teeth on the driving member being greater than the elasticity of the material of the teeth on the driven member; the driving and driven members being arranged for short-period intermittent meshing engagement during the course of which the teeth of the tooth series on the driven member engage consecutively the teeth on the driving member, the improvement wherein at least the first three teeth on said driven member constitute run-in teeth each having an undercut surface portion with respect to the other teeth of said series; the distance between said run-in teeth being smaller than the distance between the other teeth of said series; and the height of said at least first three run-in teeth progressively decreases from the first to the third run-in tooth.

3,911,758

CIRCLE DRIVE PINION FOR MOTOR GRADER

Paul Edmund Hanser, Moline, Ill., and Thomas Edward Gebauer, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 3, 1974, Ser. No. 466,535
Int. Cl.² F16H *55/06, 1/06, 55/04*
U.S. Cl. 74—462 **6 Claims**



1. In a drive pinion for driving an internal annular gear of a motor grader circle, the improvement comprising: said pinion including only three equispaced teeth; said pinion having a pitch circle which divides the profile of the teeth into radially outer and inner portions respectively of involute and hypocycloid form to thereby form tooth profiles which are a combination of involute and hypocycloid form; and said tooth profiles being dimensioned so as to satisfy the fundamental law of gearing whereby at least one tooth of the pinion will be in driving contact when the pinion is in operation.

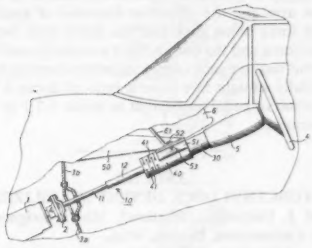
3,911,759

STEERING APPARATUS FOR VEHICLES

Yutaka Tanaka, and Masakatsu Nonaka, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 3, 1973, Ser. No. 376,164
Claims priority, application Japan, July 18, 1972, 47-71874
Int. Cl.² B62D *1/18;* **F16D** *9/00*
U.S. Cl. 74—492 **9 Claims**

1. A mechanism for a vehicle including a steering gear; a steering wheel; an axially retractable steering shaft assembly; and a column tube mounted on a portion of the vehicle and surrounding said shaft assembly coaxially therewith for rotatably journalling said steering shaft assembly, wherein said column tube is separated at a predetermined distance from a toe-board of the vehicle at its lower end, wherein said steering shaft assembly includes a breakable jointing means located within said column tube, a lower shaft connected at its lower end to said steering gear, an upper shaft connected at its upper end to said steering wheel and a middle shaft connected retractably at its lower end to the upper end of said lower shaft and separably at its upper end to the lower end of said upper shaft by way of said breakable jointing means within said



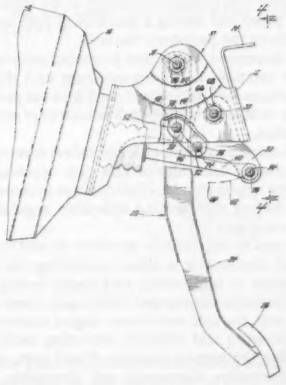
column tube, and wherein said breakable jointing means comprises separable jointing portions provided between said upper and middle shafts and a breakable member coupled over said jointing portions for securing said upper and middle shafts in an integral relation, said jointing portions including engagement faces for torque transmission between said upper and middle shafts and said jointing means being broken only radially by twisting and/or bending moments exerted on said shaft assembly during vehicle collision.

3,911,760

VARIABLE RATIO BRAKE PEDAL LINKAGE

Arthur H. Elbers, Holt, and David B. Headley, Eaton Rapids, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1974, Ser. No. 511,216
Int. Cl.² G05G *1/14*
U.S. Cl. 74—512 **4 Claims**



1. A variable ratio pedal linkage having a force input arm and a force output member, a first link, a bellcrank second link and a fixed link;

said force input arm having at one end a force receiving pedal and at the other end a first pivot on said fixed link; said bellcrank second link having a second pivot on said

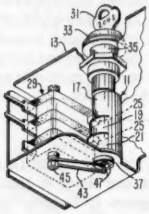
fixed link linearly spaced from said first pivot, and third and fourth pivots thereon spaced angularly apart relative to said second pivot with said fourth pivot being linearly positioned from said second pivot, said force output member being pivotally attached to said bellcrank second link at said fourth pivot and said first link being pivotally attached to said bellcrank second link at said third pivot; and a fifth pivot on said force input arm intermediate said first pivot and said pedal, said first link also being pivotally connected by said fifth pivot to said force input arm; the apply direction of pivotal movement of said force input arm and the effective direction of application of input force being such that the force ratio between the input force and the output force exerted by said bellcrank second link on said output member decreases in a substantially straight line from a ratio of about 4.7:1 at the initiation of pedal movement to about 1.7:1 at full pedal movement.

3,911,761

FUNCTION LOCK DETENT STABILIZER

Raymond J. Cornellier, Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 30, 1974, Ser. No. 510,796
Int. Cl.[2] G05G *05/06;* **F16H** *53/00;* **E05B** *09/10;* **H01H** *03/00*
U.S. Cl. 74—527 **22 Claims**



1. Improved function selecting means for use in a control panel of a data processing unit to actuate selected ones of a plurality of function switches, said means comprising:

a. a rotatable cam journally mounted in the frame structure of said panel and having a plurality of cam surfaces disposed along the periphery thereof,

b. means associated with a first journaled extremity of said cam for rotatably activating said cam such that selected cam surfaces thereof are activated into cooperating relationship with associated switch actuators of said plurality of switches,

c. a multi-sided and symmetrically recess formed in a second journaled extremity of said cam opposite said first extremity, adjacent sides of said recess presenting corner angles thereof representing selectable angular positions of said cam, and

d. a V-shaped spring fixed at its vertex to said frame structure and disposed in a plane parallelling the cross-sectional plane of said recess, said spring having a pair of offset extensions superposed within said recess and cooperating with the side and corner angles thereof, whereby upon activating said rotatably activating means to selectively alter the angular position of said cam, said pair of offset extensions alternately and cammably cooperate initially with the approaching sides of said recess and thereafter cammably and detentably cooperate with the approaching corner angles thereof to locatably define a selected angular position of said cam and to resiliently resist movement of said cam away from said defined selected position.

7. Improved function selecting means for use in a control device for mechanical apparatus whereby a plurality of function linkages may be indexed and selectably activated, said means comprising:

a. a rotatable cam journally mounted in the frame structure of said control device and having a plurality of cam surfaces disposed along the periphery thereof, each of said cam surfaces in cooperation with said function linkages being capable of producing at least one function by means of said mechanical apparatus,

b. means associated with a first journaled extremity of said cam for rotatably activating said cam such that selected cam surfaces thereof are activated into cooperating relationship with said selected ones of said function linkages,

c. a multi-sided and symmetrical recess formed in a second journaled extremity of said cam opposite said first extremity, adjacent sides of said recess presenting corner angles thereof representing selectable angular positions of said cam, and

d. a V-shaped spring fixed at its vertex to said frame structure and disposed in a plane parallelling the cross-sectional plane of said recess, said spring having a pair of offset extensions superposed within said recess and cooperating with the sides and corner angles thereof, whereby upon activating said rotatably activating means to selectively alter the angular position of said cam said pair of offset extensions alternately and cammably cooperate initially with the approaching sides of said recess and thereafter cammably and detentably cooperate with the approaching corner angles thereof to locatably define a selected angular position of said cam and to resiliently resist movement of said cam away from said defined selected position.

13. Improved means for defining the selectable angular positions of a rotatably journaled multiple surfaced function cam and for resiliently resisting the rotatable movement of said cam away from said selected angular positions, said means comprising:

a. a multi-sided and symmetrical recess formed in a journaled extremity of the cam, adjacent sides of said recess presenting corner angles thereof representing selectable angular positions of said cam, and

b. a V-shaped spring fixed at its vertex and disposed in a plane parallelling the cross-sectional plane of said recess, said spring having a pair of offset extensions superposed within said recess and cooperating with the sides and corner angles thereof, whereby upon the selectable rotation of said cam to selectably alter the angular position of the cam said pair of offset extensions alternately and cammably cooperate initially with the approaching sides of said recess and thereafter cammably and detentably cooperate with the approaching corner angles thereof to locatably define a selected angular position of said cam and to resiliently resist movement of the cam away from said defined selected position.

18. Improved adjusting means for use in association with a multiple function device and effective for adjustably selecting individual ones of said multiple functions, said means comprising:

a. a rotatably journaled function cam having a plurality of cam surfaces disposed along the periphery thereof, each of said cam surfaces being capable of producing at least one of said multiple functions,

b. a multi-sided and symmetrical recess formed in a journaled extremity of said cam, adjacent sides of said recess presenting corner angles thereof locatably representing selectable functions of said multiple function device that are rendered operative by the selectable angular positioning of said cam, and

c. a V-shaped spring fixed at its vertex and disposed in a plane parallelling the cross-sectional plane of said recess, said spring having a pair of offset extensions superposed within said recess and cooperating with the sides and corner angles thereof, whereby upon the selectable rotation of said cam to render a selected function operative said pair of offset extensions alternately and cammably

cooperate initially with the approaching sides of said recess and thereafter cammably and detentably cooperate with the approaching corner angles thereof to locatably define a function selecting angular position of said cam and to resiliently resist movement of the cam away from said defined position.

3,911,762

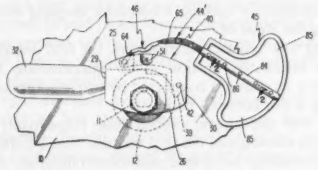
LANYARD HANDLE, METHOD OF AND APPARATUS FOR FORMING SAME

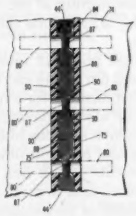
Glenn H. Mackal, 83 Chestnut Ridge Road, Saddle River, N.J. 07458

Division of Ser. No. 344,749, March 26, 1973, Pat. No. 3,809,288. This application Nov. 5, 1973, Ser. No. 412,637

Int. Cl.² G05G *1/10*

U.S. Cl. 74—543 **5 Claims**





1. The combination comprising a pull cord and a pull handle connected thereto, the handle being made of plastic material and being molded about the cord along the length of coterminous portions of the handle and cord, spaced zones of the cord within the handle having two opposite surfaces of the cord flattened, the handle having holes therein overlying said two opposite surfaces of the cord at said spaced zones, the plastic material at the boundaries of said zones having lip portions extending radially inwardly toward the axis of the cord end mechanically keying the handle to the cord.

5. A method according to claim **4**, wherein the local compression of the cord is effected by opposed core members in the mold which mask the cord from the injected plastic material at the zones of the cord which they engage.

3,911,763

ROTARY ASSEMBLY FOR THE ADJUSTMENT OF HYDRAULIC THROTTLE VALVES IN INJECTION MOLDING MACHINES

Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Germany

Filed June 10, 1974, Ser. No. 477,973

Claims priority, application Germany, July 5, 1973, 2334243

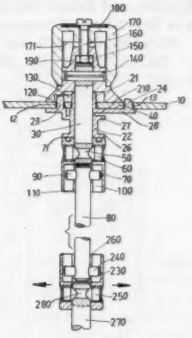
Int. Cl.² G05G *1/10*

U.S. Cl. 74—553 **12 Claims**

1. A rotary adjustment assembly adapted for adusting the angular setting of a rotary control member, such as, for example, a hydraulic throttle valve of an injection molding machine, the assembly comprising in combination:

a stationary machine wall having a central bore and at least one parallelly spaced smaller bore extending therethrough;

a stationary bearing member having a centering flange abutting against the wall from one side, said flange including a bearing sleeve in coaxial alignment with the central bore of the wall and a smaller axial extension engaging said smaller bore;



a rotatable adjustment shaft extending through the bearing member to both sides of the wall, said shaft being journalled in the bearing sleeve, thereby defining the rotational center axis of the assembly;

an adustably clampable sleeve member connected to the stationary bearing member and engaging the adjustment shaft with adjustable frictional resistance against rotation;

means for coupling the adjustment shaft to a rotary control member; and

means for rotating the adjustment shaft against said frictional resistance.

3,911,764

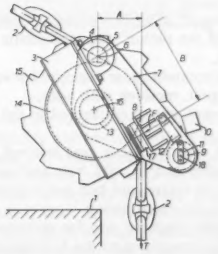
CHAIN GUIDING APPARATUS

James Daniel Duggan, 47 Avenue du Braou, 64200 Biarritz, France

Filed Oct. 23, 1974, Ser. No. 517,427

Int. Cl.² G05G *1/00, 3/00*; F16H *7/18*

U.S. Cl. 74—577 R **5 Claims**



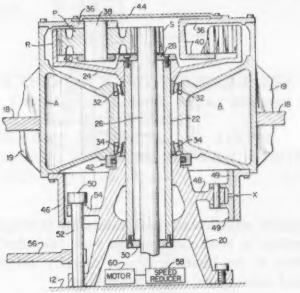
1. A chain guiding apparatus comprising a support, an arm pivotally mounted on said support so as to be turnable about a first pivot axis, a load measuring device mounted between said arm and said support at a location spaced from said axis and whereby said arm is supported on said support at said location against turning about said first pivot axis in one sense, a chain guiding pulley turnably mounted on said arm at a second location spaced from said pivot axis for turning about an axis of turning substantially parallel to said pivot axis, and a pawl pivotally mounted on said arm so as to be turnable

about a second pivot axis between an engaged position in which said pawl prevents turning of said pulley in one sense about said axis of turning relative to said support and a disengaged position in which said pawl allows such turning of said pulley.

3,911,765
SKI LIFT BULLWHEEL

Erwin A. Reschke, and Robert Heron, both of Denver, Colo., assignors to Heron-Poma Company, Denver, Colo.

Filed Oct. 26, 1970, Ser. No. 83,760
Int. Cl.² F16H *1/32;* **B61B** *11/00*
U.S. Cl. 74—801 **1 Claim**

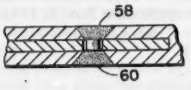


1. A ski-lift of the type comprising:
a rotatable sheave disposed at each terminal end thereof at different elevations relative to a ski slope,
an endless cable trained about the sheaves, forming two substantially parallel cable runs,
one sheave being an idler and the other being a driving bullwheel,
said bullwheel having a central hollow hub and a concentric cable engaging rim secured thereto,
a hollow central stationary support within the hub upon which the hub is supported for rotation about a substantially vertical axis,
a drive shaft disposed within the support for rotation about said axis,
said shaft having a driving pinion disposed at the upper end thereof,
an internal gear, of a pitch diameter considerably in excess of that of the pinion, disposed within the upper end of said hub,
at least one rotatable gear disposed between the pinion and internal gear, meshing with both,
a rotary power source connected to the lower end of said shaft,
said pinion, rotatable gear, and internal gear being operatively connected to said hub and so constructed and arranged to rotate said hub and bullwheel at an angular speed less than said pinion,
a pair of idler sheaves, one for each cable run, rotatable about axes transverse to the bullwheel axis, so arranged relative to the bullwheel to guide and maintain the cable portion extending around the periphery of the bullwheel in the plane thereof,
a rotary braking member carried by the lower end of the hub, and stationary brake shoe means engageable with said member,
a safety device adapted to be moved into the path of the bullwheel for blocking retrograde rotation thereof in the event of failure of the brake member, said safety device being moved into the path of the bullwheel in response to retrograde rotation thereof, and
an overrunning clutch disposed between the bullwheel and safety device.

3,911,766
BOX LOCK SURGICAL INSTRUMENT AND METHOD OF ITS MANUFACTURE

John W. Fridolph, Berlin, N.J.; Robert W. Wilson, Dresher, and Rodney J. Kulp, Harleysville, both of Pa., assignors to Pilling Co., Fort Washington, Pa.

Filed May 15, 1974, Ser. No. 469,967
Int. Cl.² B21K *21/00;* **B25B** *7/06;* **A61B** *17/28*
U.S. Cl. 76—101 R **6 Claims**

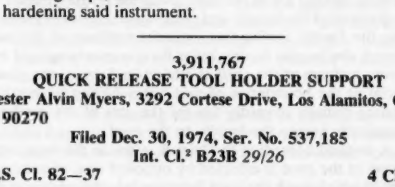


1. The method of making a box lock surgical instrument comprising the steps of:
providing first and second members, the first member having a bifurcated portion at an intermediate location whereby its ends are connected by two separate elements having a slot between them;
forming first and second aligned holes respectively in said separate elements of the first member and a third hole in an intermediate portion of said second member, the third hole alignable with the holes in the first member when said intermediate portion of the second member is positioned in the slot between said separable elements;
with the intermediate portion of the second member positioned in said slot, aligning the third hole with the first and second holes;
inserting a pin through said first, second and third holes;
electrically fusing said pin at one end to one of the separate elements of the first member for a sufficiently long period of time to produce a weld having a 75 to 100 percent depth of penetration in said one of the separate elements; electrically fusing said pin at its other end to the other of the separate elements of the first member for a sufficiently long period of time to produce a weld having a 75 to 100 percent depth of penetration in said other of the separate elements;
grinding the outside surfaces of the separate elements of the first member to remove excess material resulting from the fusing steps; and
hardening said instrument.

3,911,767
QUICK RELEASE TOOL HOLDER SUPPORT

Lester Alvin Myers, 3292 Cortese Drive, Los Alamitos, Calif. 90270

Filed Dec. 30, 1974, Ser. No. 537,185
Int. Cl.² B23B *29/26*
U.S. Cl. 82—37 **4 Claims**



1. A quick release support that may be mounted on a desired position on a machine such as a lathe to removably secure a tool holding member in a fixed initial position relative to said support, said tool holding member being of the type in which a vertically disposed groove of transverse dove tail cross section extends inwardly from a first vertical face of said tool

holding member, said groove being intermediately positioned between the ends of said first vertical face and defined by first and second spaced vertically extending elongate end faces that angle away from one another and have a vertical connecting face extending between the most inwardly disposed ends thereof, said quick release support including a block of rigid material that is secured in said desired position on said machine and that has a first vertical surface that has a vertical protuberance extending horizontally from a position intermediate the ends thereof, said protuberance of transverse dove tail cross section and of slightly lesser width and depth than that of said groove, said protuberance defined by a first end surface and two vertically spaced second end surfaces, said first and second end surfaces having a vertical connecting surface extending therebetween, said protuberances having a vertically extending rectangular slot therein adjacent said second end surfaces and in communication with a vertical space between said second end surfaces, said slot partially defined by a first vertical wall that is angularly disposed relative to said first surface, a cavity of rectangular transverse cross section in said block that is partially defined by second and third vertical, laterally spaced walls, said second wall and first wall lying in the same vertical plane, said quick release support block including:

a. a rigid elongate body of rectangular transverse cross section of less length than said cavity that is slidably supported therein said body having first and second ends;

b. a rigid head supported from said first end of said body, said rigid head when said body is in a first position in said cavity having a first side that is parallel to said first wall and in abutting contact therewith, a second side that lies in the same vertical plane as said connecting surface, and a third vertical side that lies in the same vertical plane as said two second end surfaces;

c. a rod that extends outwardly from said second end of said body, said rod having threads on at least the portion adjacent the free end thereof, said rod of sufficient length as to extend longitudinally through a bore and a recess formed in said block that are coaxially aligned with said cavity, said bore and recess at their junction defining an annulus shaped body shoulder of substantial area;

d. a cylindrical sleeve rotatably supported in said recess, said sleeve having internal threads that engage said threads on said rod, said sleeve having first and second ends, said first end in rotatable sliding contact with said body shoulder, and said second end outwardly disposed from said block;

e. a handle secured to said second end of said sleeve; and

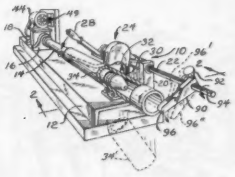
f. spring means that at all times tend to maintain said first end of said sleeve in contact with said body shoulder, with said handle and sleeve when rotated in an appropriate direction moving said body and head in a direction that said third side of said head pressure engages said second end face of said groove in said tool holding member and by so doing brings said first and second end faces and connecting face into pressure contact with said first and second end surfaces and connecting surface of said protuberance to removably support said tool holding member from said block and in said desired initial position thereon, and said support permitting said tool holder to be removed therefrom and replaced thereon in said initial position.

3,911,768
CORE CUTTING APPARATUS

Mak S. Kawano, Wheaton, Ill., assignor to American Tara Corporation, Chicago, Ill.

Filed Aug. 16, 1974, Ser. No. 498,233
Int. Cl.² B23B *3/04, 5/14*
U.S. Cl. 82—86 **14 Claims**

1. Apparatus for cutting off predetermined lengths of an elongated core member comprising a mandrel, drive means to rotate the mandrel, radially movable locking means on the mandrel selectively engageable with the inner surface of a core to permit the core to rotate with the mandrel, a rotatable disc-shaped cutter, pivoted cutter support means for moving the cutter into contacting relation with the external surface of a core mounted on the mandrel, manually operated means positioned on said pivoted cutter support means for selectively aetuating said drive means independently of the movement of

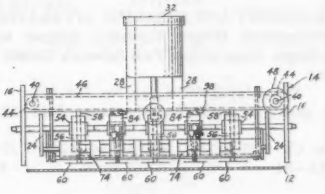


the pivoted cutter support means, axially movable means in said mandrel for moving said locking means radially outwardly, and linkage means connected to said pivoted cutter support means for engaging and moving said axially movable means, said linkage means causing said locking means to engage a core mounted on said mandrel ans said pivoted cutter support means is actuated to move said cutter into contacting relation with the core.

3,911,769
ROLL SLICING SYSTEM

Dale S. Lecrone, Jackson, Mich., assignor to LeMatic, Inc., Michigan Center, Mich.

Continuation-in-part of Ser. No. 367,844, June 7, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,623
Int. Cl.² B26D *3/08, 4/76*
U.S. Cl. 83—4 **24 Claims**

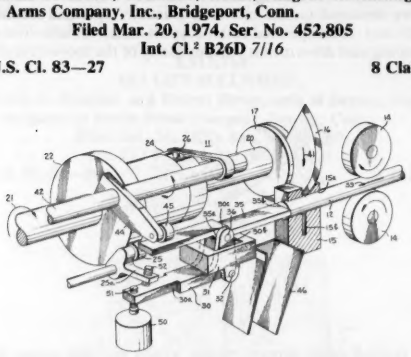


1. A machine for slicing rolls between the tops and bottoms thereof while arranged in clusters of adjoined rolls by cutting into one side of each roll along a longitudinal joint between adjacent rolls in said cluster, said machine comprising conveyor means operable to support and feed clusters of rolls along a predetermined path and a rotating knife mounted upon the end of a drive shaft extending substantially perpendicularly to said conveyor means and supporting said knife in spaced parallel relation thereto to position said knife substantially midway between the top and bottom of rolls to be sliced, in combination with means positioned forwardly of said drive shaft in said path of movement of rolls to be sliced and supported for rotation about a substantially vertical axis and substantially in longitudinal alignment with said shaft and above said knife and operable to break apart a pair of rolls along the joint therebetween above the slice therein to provide a clearance between said pair of rolls for passage of said shaft therethrough incident to said rolls being sliced from end to end.

3,911,770
MACHINE AND METHOD FOR CUTTING SLUGS HAVING A UNIFORM LINEAR DIMENSION

Frank P. Boden, Trumbull, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Mar. 20, 1974, Ser. No. 452,805
Int. Cl.² B26D 7/16
U.S. Cl. 83—27 **8 Claims**

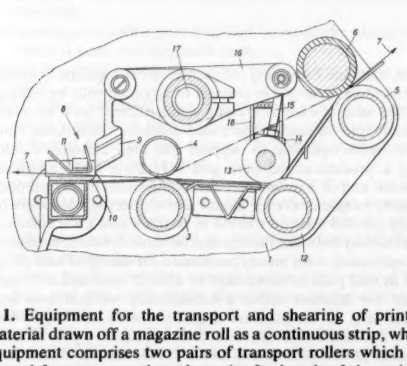


1. A machine for cutting pieces having a uniform linear dimension from stock moving past a cutting means, along a path of travel, said machine comprising cutting means for severing pieces from stock, a pivotably mounted arm, a stop member mounted on the arm and positioned in the path of travel of the stock a predetermined distance from the cutting means when the arm is in a normal operating position, biasing means for moving the arm from the normal operating position in a direction to move the stop means toward the cutting means, camming means for selectively holding the arm in and releasing the arm from its normal operating position, means for directing each severed piece to a first collection area, deflector means operable to divert a piece to a second collection area, switching means responsive to motion of the arm to operate the deflector means for diverting a piece when the arm moves from its normal operating position.

3,911,771
TRANSPORT AND SHEARING APPARATUS

Karl Schleifenbaum, Haiger, Germany, assignor to Firma Meteor-Siegen Apparatebau Paul Schmeck GmbH, Siegen, Germany

Filed May 2, 1974, Ser. No. 466,165
Claims priority, application Germany, June 22, 1973, 2331653
Int. Cl.² B23D 33/02; B23Q 7/14; B26D 5/22
U.S. Cl. 83—81 **4 Claims**

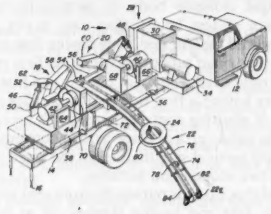


1. Equipment for the transport and shearing of printing material drawn off a magazine roll as a continuous strip, which equipment comprises two pairs of transport rollers which are spaced from one another along the feed path of the strip, a deflector roller which is located between the pair of transport rollers and which is movable between an operative position and an inoperative position to vary the strip path length between the pairs of transport rollers, a shearing device situated adjacent the first of the pairs of transport rollers in the feed direction, and an automatic guide system arranged to move the deflector roller from the operative position towards the inoperative position in order to decrease the strip path length when the shearing device is actuated and the first pair of transport rollers is brought to a stop, said shearing device comprising a movable blade which is operatively connected to the deflector roller so that cutting movement of the blade is accompanied by movement of the deflector roller from its operative position, said blade being pivoted adjacent one end of a rocker lever, the deflector roller being pivoted adjacent the other end of that lever.

3,911,772
MOBILE MATERIAL CUTTER

Robert Kisielewski, Onalaska, Wis., assignor to Cryogenic Recycling International Inc., LaCrosse, Wis.

Filed Feb. 6, 1974, Ser. No. 439,916
Int. Cl.² B23D 17/06
U.S. Cl. 83—278 **2 Claims**



1. A mobile material-chopping apparatus, for chopping substantially ring-shaped bodies into segments, which includes: an elongated movable bed; shear means which include movable cutting jaws for chopping the body delivered thereto into segments; delivery conveyor means cooperatively arranged with respect to said bed and said shear means for moving the bodies from a loading position to said shear means; and means for actuating said shear means so as to chop said body, wherein said shear means include cutting means which move in a substantially vertical plane which is parallel to the longitudinal axis of said bed; and wherein said cutting means include two aligned shears each including a stationary lower jaw and a movable upper jaw pivotally mounted for shearing cooperation with said lower jaw, and the shears being spaced from each other by a distance sufficient to permit at least a portion of said delivery conveyor to fit therebetween, so as to deliver said ring-shaped body to a chopping position between the upper and lower jaws of each shear for chopping into segments.

3,911,773
APPARATUS FOR CUTTING MATERIAL AT FIXED LENGTH

Ikuji Inowaki, Isezaki, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1974, Ser. No. 449,836
Claims priority, application Japan, Mar. 15, 1973, 48-30427
Int. Cl.² B26D 1/56; B23D 25/04
U.S. Cl. 83—320 **9 Claims**

1. An apparatus for cutting a moving object to a predetermined length, comprising:

a frame;

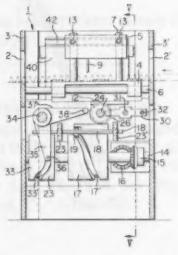
a lower cutter base means movably supported on said frame for reciprocating movement in a substantially horizontal direction, said lower cutter base means having a transfer-

ring path on the upper surface thereof and substantially parallel to said horizontal direction for permitting conveyance of the object to be cut;

an upper cutter base means spaced above said lower cutter base means and supported for movement upwardly and downwardly relative to said lower cutter base means, and means coacting between said upper and lower cutter base means for causing synchronous reciprocating lateral movement thereof;

upper and lower cutters mounted on the respective upper and lower base means and disposed opposite one another for cutting an object;

a first movement mechanism for causing reciprocating movement of said upper and lower cutting base means in said horizontal direction to effect, at least during a portion of the forward stroke of said base means, a velocity of said base means corresponding to the velocity of the moving object;



said first movement mechanism including rotatable drive shaft means supported on said frame, a first cylindrical cam nonrotatably mounted on said drive shaft means, and a positive drive linkage connected between said first cylindrical cam and one of said base means for causing a positively driven forward and backward reciprocating movement of said upper and lower cutter base means; and

a second movement mechanism for causing reciprocating vertical movement of said upper base means to effect cutting of said object during the forward stroke of said base means, said second movement mechanism including a second cylindrical cam nonrotatably mounted on said drive shaft means and link means connected between said second cam and said upper cutter base means for causing vertical reciprocating movement of said upper cutter base means in response to rotation of said second cam.

3,911,774

POWERED ADJUSTABLE TRIMMER CONSTRUCTION

Lewis F. Jennings, McHenry, and Kenneth W. Bower, Des Plaines, both of Ill., assignors to UARCO Incorporated, Barrington, Ill.

Filed Dec. 20, 1973, Ser. No. 426,452

Int. Cl.² B26D *7/06*

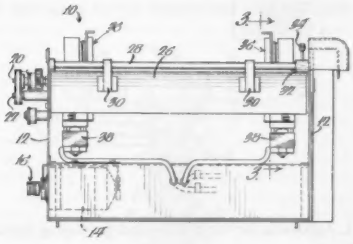
U.S. Cl. 83—425.2 **2 Claims**

1. In a continuous business forms stationery processing apparatus, the combination comprising:

means defining a path of stationery travel through said apparatus;

means for driving stationery through said apparatus along said path; and

means for trimming opposed longitudinal edges of the stationery including a pair of trimming devices, one on each side of said path, means mounting said trimming devices for independent movement towards and away from each other whereby the location of the trimming devices with respect to the sides of said path may be selectively and individually adjusted for different stationery widths, and a pair of individually and selectively operable, reversible motors, one for each trimming device, for independently moving and adjusting the associated trimming device relative to the associated side of said path, said mounting means including an elongated, stationary shaft extending



transversely to said path, said shaft having rack teeth thereon, and each of said trimming devices includes a carriage slidably mounted on said shaft, and each of said motors is mounted on and carried by the associated carriage and includes a rotary output shaft having a gear thereon in engagement with said rack teeth.

3,911,775

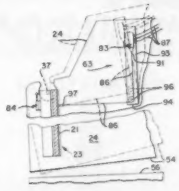
RAKE ANGLE AND RELATED STROKE CONTROL FOR A SHEAR OR THE LIKE

Eugene W. Pearson, Orinda, Calif., assignor to Canron, Inc., Oakland, Calif.

Division of Ser. No. 371,069, June 18, 1973, Pat. No. 3,872,758. This application Oct. 10, 1974, Ser. No. 513,563

Int. Cl.² B26D *5/12*

U.S. Cl. 83—626 **9 Claims**

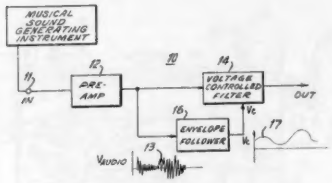


1. A rake angle control for use with a machine such as a shear or the like having a frame, a ram assembly slidably supported with respect to said frame, said ram assembly including slide means and a ram mounted to said slide means for selective angular displacement to effect adjustment of the rake angle of said ram, and drive means operatively connected to slidably move said ram assembly, said drive means including a motor pivotally coupled to said ram assembly to enable angular displacement of said ram, said rake angle control comprising a valve assembly, cable tensioning and relaxing means, and cable means coupling said valve assembly to said cable tensioning and relaxing means, said rake angle control being mounted on said ram assembly and coupled at one point to said ram and at another point to said slide means, said cable means following a path which changes in length in response to angular displacement of said ram.

3,911,776
SOUND EFFECTS GENERATOR

Michael L. Beigel, Warwick, N.Y., assignor to Musitronics Corporation, Rosemont, N.J.

Filed Nov. 1, 1973, Ser. No. 411,764
Int. Cl.[2] G10H *1/02*; H03H *7/10*
U.S. Cl. 84—1.11 24 Claims



1. Apparatus for varying a sound generating signal comprising:

voltage controlled filter means having a variable peak response frequency for transmitting at a maximum amplitude those frequencies included in said sound generating signal that correspond to said filter peak response frequency, said peak response frequency being determinable by a control voltage applied to said filter means;

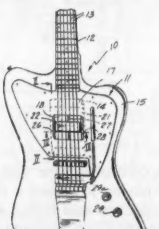
envelope follower means comprised of rectifying means for transmitting sound generating signals of a single predetermined polarity and low pass filter means coupled to said rectifying means for generating a control voltage proportional to the amplitude of the envelope of said sound generating signal and for supplying said control voltage to said voltage controlled filter means;

and means for supplying said sound generating signal to said voltage controlled filter means and to said envelope follower means.

3,911,777
ELECTRIC GUITAR WITH SLIDABLE PICKUP BENEATH STRINGS

Stanley E. Rendell, Kalamazoo, Mich., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Aug. 8, 1974, Ser. No. 495,558
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.16 11 Claims



1. An electric guitar having strings, comprising:

a. a body having a cavity with a cutout portion therein over which the strings extend;

b. a slide member having a length and width exceeding that of said cutout portion, opposite edges of which are trapped in said cavity, said slide member being selectably movable in a direction parallel to that of the strings; and

c. an electric pickup secured to said slide member and having clearance with respect to said cutout portion and responsive to string vibrations;

whereby the guitar player may alter pickup location and hence tonality of the guitar during playing.

3,911,778
GUITAR CONSTRUCTION

Robert L. Martin, Glastonbury, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Nov. 8, 1974, Ser. No. 522,269
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—267 10 Claims

1. In a guitar, the combination comprising a hollow sound box including an integrally molded one piece bowl-shaped body which has a relatively thin wall of subtantially uniform thickness and which also defines a thickened portion projecting inwardly of its inside surface to define an integrally molded neck block adjacent the upper boundary of said body, a neck for attachment to said neck block, said neck including an elongated neck frame member having a portion adjacent its lower end which cooperates with said neck block to define a mortise and tenon joint therebetween, said neck frame member having a portion adjacent its upper end which forms a peg board for receiving the posts to which the guitar strings are mounted, said neck frame member having an intermediate portion which is of generally T-shaped cross sectional configuration, and a low weight plastic back member carried by a rearwardly projecting rib defined by the stem of the T-shaped frame, said plastic back member being molded to have a generally convex external contour and the opposed longitudinally extending lateral edges of said back member being faired into the laterally opposed longitudinally extending side edges of the T-shaped neck frame member.

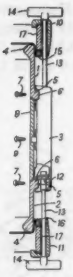
3,911,779
MUSICAL DRUMS

Clifford Della-Porta, Rothley, England, assignor to The Premier Drum Company Limited, South Wigston, England

Filed June 13, 1974, Ser. No. 478,925
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 4 Claims

1. A drum shell comprising a rigid, generally cylindrical frame comprising a cylindrical body wall, a circular end support at each end of said body wall, each end support being in the form of a ring with a peripheral rib, a plurality of parallel brackets spaced from one another around the periphery of the assembly of end supports and body wall, said brackets being

formed at their ends with notch means for complementary engagement with the rib of at least one of the end supports,



and means for securing said brackets to said cylindrical body wall and said end supports.

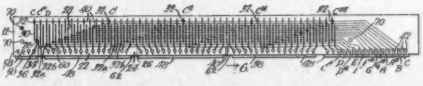
3,911,780
ARPEGGIO KEYBOARD

Charles A. Dyle, Chicago, and John W. Edwards, Lake Zurich, both of Ill., assignors to Hammond Corporation, Chicago, Ill.

Continuation of Ser. No. 272,681, July 17, 1972, abandoned. This application Apr. 17, 1974, Ser. No. 461,662

Int. Cl.² G10C *3/12*

U.S. Cl. 84—423 **2 Claims**



1. A miniature keyboard for an electronic musical instrument comprising:

a circuit board having a plurality of mutually spaced conductive contract fingers printed on one side thereof, in a single row, said contact fingers being grouped in pairs with each of said pairs associated with one unique note of at least two octaves of musical notes;

An electrically insulating spacer sheet disposed on said circuit board over said contact pairs and defining a single window therein exposing at least a portion of each finger of each contact pair with no intervening spacer material between respective adjacent contact pairs;

a flexible sheet of electrically insulating material having mutually spaced regions of conductive material thereon and being mounted on said spacer sheet, each of said regions of conductive material being dimensioned and positioned to overlie a single one of said contact pairs and being normally spaced therefrom by said spacer sheet;

said keyboard being dimensioned such that adjacent contact pairs over the entire length of the keyboard are rapidly connected and disconnected in succession by the pressure of a single fingertip moving therealong.

3,911,781
ANCHOR SLEEVE FOR USE IN BORES FORMED IN RELATIVELY EASILY FRIABLE MATERIALS

Adolf Bappert, Denzlingen, Germany, assignor to Upat-Max Langensiepen KG, Emmendingen, Germany

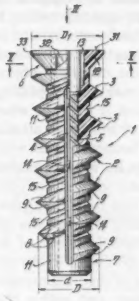
Filed Nov. 20, 1973, Ser. No. 417,522

Claims priority, application Germany, Nov. 21, 1972, 2256938

Int. Cl.² F16B *25/00*

U.S. Cl. 85—47 **14 Claims**

1. An anchor sleeve for use in bores formed in material having relatively low cohesion, such as gypsum walls, comprising a non-expanding tubular body having a leading end, a trailing end, and an outer circumferential surface; a screw-thread formed on and projecting from said outer circumferential surface intermediate said ends and having a plurality of screw flights and at least one self-tapping edge which forms an internal passage in said material for said screw-thread when said body is threaded in one direction into a bore in the material, said edge having a pair of flanks adjacent to and projecting outwardly beyond one of said screw flights; a recess formed in said screw-thread intermediate said ends and ex-



tending substantially to said surface, said recess being bounded on its one side by a line extending axially of said body and on its other side by surface portions of the respective screw flights; and a slot formed in said body intermediate but short of said ends and ahead of said surface portions, seen with reference to said direction, and communicating with said recess and with the interior of said body, said slot being dimensioned so large that particles of said material dislodged by said screw flights can freely enter via said recess and slot into said interior to thereby reduce the resistance opposed by said material to turning of said body.

3,911,782
DOUBLE SPREADING DOWEL

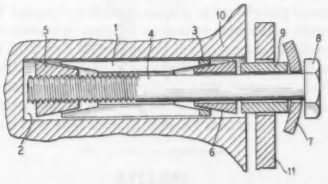
Heinrich Liebig, Crumstaedter Str. 23, 6102 Pfungstadt, Germany

Filed Oct. 1, 1973, Ser. No. 402,055

Claims priority, application Germany, Oct. 11, 1972, 2249762

Int. Cl.² F16B *13/06*

U.S. Cl. 85—67 **4 Claims**



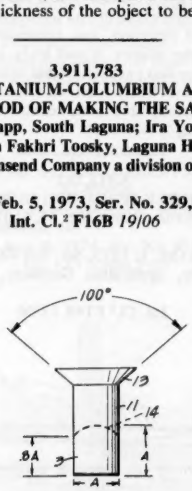
1. An expanding dowel anchor to be inserted into a bore in a base member for attaching an object to the base member comprising: a tube member consisting of a plurality of individual segments, the segments connected together at an outer end of the tube by breakable bars, inner and outer spreading members arranged respectively at opposite inner and outer ends of the tube, a threaded bolt extending through the spreading members and tube in threaded connection with the inner spreading member and freely received through the outer spreading member, the spreading members capable of being pulled towards each other as a result of rotation of the

threaded bolt, axial movement of the spreading members towards one another radially expanding the tube segments, a supporting disc positioned around the bolt intermediate a head end of the bolt exterior of the tube and the outer spreading member positioned at the outer end of the tube, the supporting disc member having an outer peripheral portion which projects in the direction of the tube to a greater extent than a central portion of the supporting disc, the central portion of the supporting disc operatively abutting the outer spreading member, the supporting disc being deformable under axial force applied thereagainst by the head of the bolt, the axial force being transmitted through the central portion of the supporting disc to the outer spreading member to expand the outer end of the tube by movement of the outer spreading member after the object to be attached to the base has been entrapped between the outer peripheral portions of the supporting disc and the base, the supporting disc having a configuration in the direction of the tube whereby the outer periphery will contact the object to be attached to the base before the central section becomes level with the object to be attached, the object to be attached having an aperture therethrough with a diameter greater than the central portion of the supporting disc but less than the outer periphery of the disc with the bolt projecting through the aperture, the disc being deformed and the central portion of the disc transmitting an axial force from the bolt head to the outer spreading member after axial movement of the tube member has been stopped by expansion of the inner end within the bore, a spacer tube positioned between the central portion of the supporting disc and the outer spreading member, the operative abutting of the disc and the outer spreading member being through the spacer tube, the spacer tube freely passing through the aperture in the object to be fastened, and the spacer tube having a length greater than the thickness of the object to be fastened.

3,911,783
RIVET OF TITANIUM-COLUMBIUM ALLOY AND METHOD OF MAKING THE SAME

Roland Howard Gapp, South Laguna; Ira York, Costa Mesa, and Rahmatollah Fakhri Toosky, Laguna Hills, all of Calif., assignors to Townsend Company a division of Textron, Santa Ana, Calif.

Filed Feb. 5, 1973, Ser. No. 329,590
Int. Cl.² F16B *19/06*
U.S. Cl. 85—73 **1 Claim**



1. A rivet made of an alloy consisting only of titanium and columbium, the percentage of titanium in the alloy being about 55% and the percentage of columbium being about 45%,

a head on one end of said rivet,

a tail on the other end of said rivet,

a shank between said head and tail,

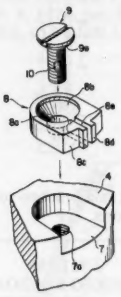
said shank being of higher tensile and shear strength than said tail,

and said tail being ductile so as to be capable to be upset against a work, and being of a length approximately 0.8 to 1.00 of the diamenter of the shank of the rivet.

3,911,784
VALVE ASSEMBLY OF VALVED WIND MUSICAL INSTRUMENT

Tsuyoshi Shiono, Tokyo, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 28, 1974, Ser. No. 501,438
Int. Cl.² G10D *9/04*
U.S. Cl. 84—392 **5 Claims**

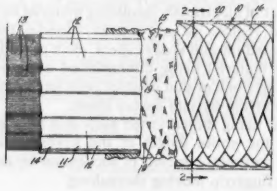


1. A valve assembly for use in a valved wind musical instrument, comprising a tubular outer casing having a groove extending longitudinally on the inner wall of the casing, a piston valve slidably and reciprocatingly housed in said outer casing, a lug member having a pair of abutting projections fitted in said groove, said projections assuming a distance therebetween and being movable along the longitudinally extending groove, and means for securing said lug member to the piston valve and for adjustably varying the distance between said pair of projections.

3,911,785
PARALLEL YARN ROPE

Henry Alexander Hood, Moorestown, N.J., assignor to Wall Industries, Inc., Beverly, N.J.

Filed Jan. 18, 1974, Ser. No. 434,627
Int. Cl.² D04C *1/12*
U.S. Cl. 87—1 **13 Claims**



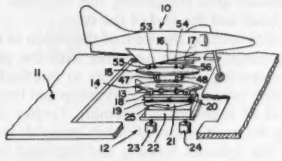
1. A rope comprising: a plurality of rope yarns extending substantially in parallel relation with one another to form a core with each yarn having a series of filaments, a binder coating the surface of each yarn and bonding said yarns together in said relation so that inner ones of said filaments are substantially free from binder, a protective jacket surrounding said core, and means providing a flexible non-porous layer between said core and said jacket adhesively bonding and mechanically securing said jacket to said core, so that when tension is applied to the rope the tension is transmitted through the layer and to the yarns of the core.

3,911,786

ORDNANCE ALIGNMENT AND LOADING APPARATUS

Frank L. Scheetz, New Hope; Francis E. Buck, Warminster, and William B. Shepard, North Wales, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 26, 1973, Ser. No. 428,533
Int. Cl.² B64D 7/00, 9/00
U.S. Cl. 89—1.5 R 8 Claims



1. In combination with ordnance loading apparatus of the type wherein lifting means cooperate with elongated ordnance receiving means for raising ordnance into position for final attachment of lugs mounted on the receiving means to latches mounted on ejector means attached to an aircraft, the improvement which comprises:

pin means detachably mounted on the receiving means;

receptacle means detachably mounted on the ejector means and having a conical opening for receiving said pin means, the positions of said pin and receptacle means being the same relative to the lugs and latches of the receiving and ejector means respectively;

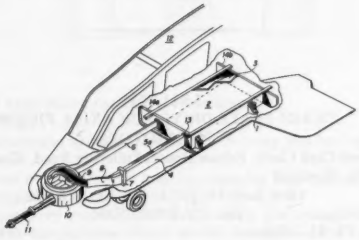
skid means formed to rigidly support and transport the ordnance to the aircraft; and means pivotally connected to the lifting means having a surface for supporting the skid and the ordnance and including inflatable bag means for selectively imparting a vertical force to said surface whereby said pin means enters said receptacle means and guides the ordnance into final alignment with the aircraft for engaging the corresponding lugs and latches.

3,911,787

SAFE AIRCRAFT AMMUNITION CONTAINER

Charles M. Seibel, Hurst, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Feb. 28, 1974, Ser. No. 446,701
Int. Cl.² B64D 1/04
U.S. Cl. 89—34 7 Claims



1. An airborne ammunition container for an aircraft, comprising:

a. a housing container to accommodate ammunition pieces;

b. said housing container connected to said aircraft external to the primary aircraft structure;

c. a blowout cover on the bottom of said ammunition container whereby an explosion in the container can be vented down through the cover;

d. means for storing ammunition pieces within said housing container such that the trajectory of said ammunition pieces when detonated within said container is away from said aircraft; and

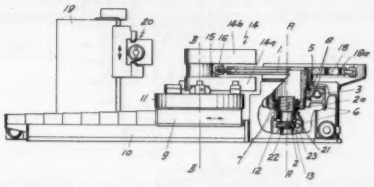
e. means to eject said housing container from said aircraft.

3,911,788

MILLING MACHINE FOR MILLING CRANKWEBS AND CRANKPINS

Edmund Eich; Anton von den Hoff, and Rolf Dieter Neuser, all of Coburg, Germany, assignors to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg, Germany

Filed July 13, 1973, Ser. No. 378,957
Claims priority, application Germany, Aug. 1, 1972, 2237795
Int. Cl.² B23C 1/14
U.S. Cl. 90—20 3 Claims



1. In a milling machine having a frame and a rotatable workpiece support rotatably supported on said frame by first support means for movement about a first vertical axis and a rotatable milling wheel rotatably supported on said frame by second support means for movement about a second vertical axis parallel to said first vertical axis, drive means for said milling wheel, said milling wheel having a plurality of cutter means thereon and transport means for effecting a relative movement between said first and second support means and, consequently, said first and second vertical axes toward and away from each other, the improvement comprising wherein said first and second support means on said frame are located below the axially central plane of said milling wheel, said plane being perpendicular to said vertical axes, said milling wheel having a shaft which is rotatably supported on a nut, said nut being vertically adjustable by means of an adjusting spindle mounted for rotation but axially immovable in said frame, said milling wheel having a sufficient diameter to extend radially outwardly beyond the radial extent of said second support means to overlap said workpiece support when said first and second axes are spaced toward each other, said workpiece support and said milling wheel being completely free from machine support structure vertically thereabove when said first and second axes are spaced away from each other to facilitate the use of an overhead lifting device to assist in (1) the removal or placement of workpieces on said workpiece support and (2) the removal or placement of another milling wheel on said second support means.

3,911,789

IMPACT TOOLS

John V. Bouyoucos, Brighton, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,626
Int. Cl.² F01B 7/18, 31/00
U.S. Cl. 91—321 25 Claims

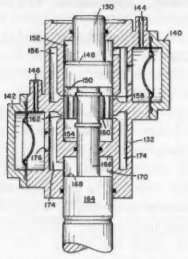
1. A hydroacoustic oscillator operated by a pressurized fluid source having a supply and a return, said oscillator comprising a mass movable in one direction and then in the opposite direction during each cycle of its oscillation,

means including said mass defining at least a first cavity and a second cavity, the volume of which are varied by said

mass in opposite senses with movement of said mass in the same direction,

means providing a third cavity, said third cavity being a gallery extending along the path of movement of said mass between said first and second cavities and being in communication with said second cavity, said gallery being disposed circumferentially around said first and second cavities,

means for maintaining said supply in communication with one of said second cavity and said third cavity for maintaining said pressurized fluid in said second cavity for the entire cycle of oscillation of said mass,



said mass presenting in a plane normal to the motion of said mass a larger area to said first cavity than to said second cavity,

means operated by said mass for providing communication between said first cavity and said supply and said first cavity and return during successive portions of each cycle of oscillation, and

means also providing communication between said first and third cavities during that portion of each cycle when said first cavity is in communication with said supply whereby to provide a direct path for flow exchange through said third cavity between said first and second cavities due to the motion of said mass and the difference in said areas presented by said mass to said first and second cavities.

3,911,790

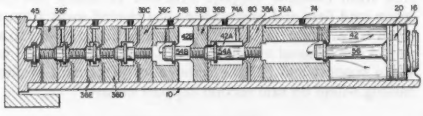
MULTIPLE POSITION CYLINDER

W. Maynard Gaitten, Sylacauga, Ala., assignor to Soderhamn Machine Manufacturing Company, Talladega, Ala.

Continuation of Ser. No. 265,464, June 23, 1972, abandoned. This application July 11, 1974, Ser. No. 487,617

Int. Cl.[2] F15B *11/18*

U.S. Cl. 91—167 R **11 Claims**



1. A multiple position cylinder comprising:

a. a cylinder housing having an internal bore and a front end and a rear end;

b. a primary piston assembly having a piston head, means for sealably mounting the piston head for sliding movement within the cylinder bore, and a piston rod extending outwardly of the front end of the cylinder;

c. a plurality of secondary piston assemblies axially aligned between the primary piston assembly and the rear end of the cylinder, each piston assembly having a piston head, means for sealably mounting each secondary piston head for sliding movement within the cylinder bore, each piston head defining with the cylinder bore a fluid-tight chamber with the piston head on either side, the most rearward piston head defining a chamber with the rear end of the cylinder and each piston head having a forward and a rearward face, a stem fixedly connected to and extending axially and rearwardly from the rearward face of the primary piston head and each secondary piston head, said stem having an end terminating in the chamber between said piston head and the next succeeding piston head, whereby fluid admitted to any one of said chambers acts on a surface area substantially equal to the cross-sectional area of the internal bore of the cylinder housing, said surface area comprising the rearward face of the piston head and the end of the stem;

d. means interlocking the stem of the piston of the immediately preceding piston assembly with the piston of the next succeeding piston assembly to interlock the piston assemblies in end-to-end relationship and limit the length of travel of each piston assembly, further means interlocking the most rearward piston assembly stem with the end of the cylinder housing and the total length of extended travel of all succeeding piston assemblies being equal to, or less than, the length of extended travel of each preceding piston assemblies, said means for interlocking the piston assemblies comprising a guide plate spaced from and connected to the forward face of the piston head of each secondary piston assembly and a guide plate spaced from and connected to the rear end of the cylinder, said plates having a central aperture with the stem of the preceding piston head extending rearwardly through the aperture in said guide plate, stop means on each stem located behind the guide plate to limit the length of forward travel of the stem with respect to the guide plate and hence the attached piston assembly with respect to the next succeeding piston assembly, and a guide ring around the outer surface of each of the guide plates connected to the secondary piston heads that engages the cylinder bore to maintain the secondary piston assemblies in axial alignment within the cylinder;

e. a plurality of fixed fluid inlet ports in the cylinder, each port communicating with one of said chambers over the total length of travel of all the succeeding piston assemblies;

f. means for selectively supplying fluid to said chambers whereby each actuated piston assembly slides all preceding piston assemblies the length of travel of said actuated assembly so that the length of travel of the primary piston rod is equal to the cumulative total of the actuated piston assemblies; and

g. means for returning and maintaining said piston assemblies in their initial retracted position except when fluid is supplied to said chambers.

3,911,791

SWASH-PLATE DRIVE FOR AXIAL PISTON PUMPS/MOTORS

Robert Cecil Clerk, Edison House, Fullerton Road, Glenrothes, Fife, Scotland

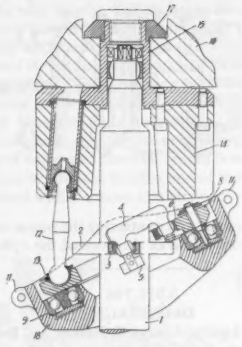
Filed June 15, 1973, Ser. No. 370,346

Int. Cl.[2] F01B *13/04*

U.S. Cl. 91—499 **2 Claims**

1. An axial piston pump/motor having variable tilt angles swash-plate stroke control and rotary port-face hydraulic distribution control, characterized by a rotary swash-plate member in which piston-thrust torque reaction and developed torque on the rotary swash-plate member is transmitted directly to a rotary main driving shaft by spherically jointed links interconnecting said rotary swash-plate member to said shaft, a cylinder barrel being located on a sleeve loosely keyed to said driving shaft so that piston-thrust torque reaction and

developed torque is not transmitted directly from said cylinder barrel to said driving shaft, and the rotary swash-plate member



being supported by a thrust bearing on a non-rotating tilt member.

3,911,792

CONTROL SYSTEM FOR AN AXIAL PISTON MACHINE

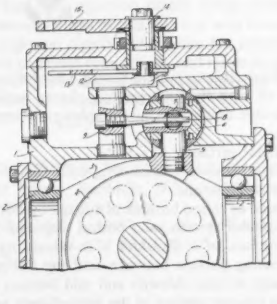
Walter Heyl, Oberafferbach, and Karl-Heinz Bergmann, Feldkahl, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Oct. 19, 1973, Ser. No. 407,960

Claims priority, application Germany, Oct. 20, 1972, 2251628

Int. Cl.² F01B *3/00*, *13/04*

U.S. Cl. 91—505 **2 Claims**



1. An axial piston machine comprising:
a housing;
an axial-piston arrangement in said housing and having an output;
a pivotal member in said housing engaging said axial piston arrangement for controlling said output;
an input lever externally of said housing and swingable to control the position of said pivotal member;
a first shaft extending through a wall of said housing and engaging said input lever while being rotatable thereby about a first fixed axis;
a cam affixed to said first shaft within said housing for rotation about said first fixed axis with said first shaft, said cam having a noncircular surface;
a cam follower in said housing engaging said surface;
a transmission lever within said housing including a first arm carrying said cam follower, a second shaft rotatable in said housing about a second fixed axis, and a second arm carried by said second shaft;
a linearly shiftable pilot piston in said housing engaged by said second arm for displacement in accordance with a predetermined response characteristic upon displacement of said input lever;
a follower piston fluid coupled with said pilot piston and responding to the displacement thereof for a following displacement; and
means connecting said follower piston to said pivotal member.

3,911,793

FLUID PRESSURE TO MECHANICAL ROTATIONAL POSITION CONVERTING MECHANISM

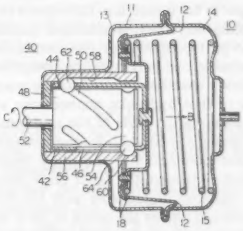
Masao Izumi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Japan

Filed June 1, 1973, Ser. No. 365,963

Claims priority, application Japan, June 3, 1972, 47-54791

Int. Cl.² F01B *3/00*

U.S. Cl. 92—33 **2 Claims**

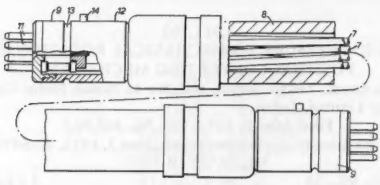


1. A device for converting a fluid pressure input into a mechanical rotational position output, comprising:
diaphragm means movable responsive to a fluid pressure input;
guide means comprising a stationary sleeve;
cam driver means secured to the diaphragm means for axial movement therewith in response to said input, the cam driver means comprising a tubular slide member, coaxially disposed in said guide means;
a rotary cam comprising a substantially cylindrical member coaxially disposed in said cam driver means, the cam having a rotary output shaft coaxially extending therefrom;
there being at least one longitudinal recess and at least one peripheral recess in an inner peripheral wall of said stationary sleeve; at least one round hole and at least one longitudinal hole extending through said tubular slide member; and at least one helical groove and at least one peripheral groove in said cam;
a spherical driving member retained in a space defined by said longitudinal recess, round hole, and helical groove for causing rotation of said rotary cam in response to reciprocation of said cam driver means; and
a spherical guiding member retained in a space defined by said peripheral recess, longitudinal hole, and peripheral groove for preventing rotation of said cam driver means, whereby reciprocation of said diaphragm means in response to a fluid pressure input causes rotation of said output shaft.

3,911,794
HYDRAULIC MACHINE ASSEMBLY

Keith Cheshir, Cheltenham, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, England

Continuation of Ser. No. 293,948, Oct. 2, 1972, abandoned.
This application Mar. 5, 1974, Ser. No. 448,231
Claims priority, application United Kingdom, Oct. 1, 1971, 45779/71
Int. Cl.² F01B *1/02*
U.S. Cl. 92—61 **3 Claims**



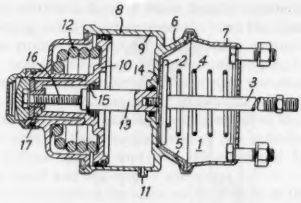
1. A hydraulic machine assembly comprising a pair of relatively movable hydraulic machine members, a plurality of internal passages in each machine member, a first detachable two part coupling for the first machine member, a second detachable two part coupling for the second machine member, each detachable two part coupling comprising a first part having a first body member secured to the machine member and a plurality of first hydraulic connections within the first body member forming the ends of the said internal passages, a second part having a second body member and a plurality of second hydraulic connections, one body member being of socket formation to receive the other body member within it and a locking member engageable with the two body parts when one is received within the other to lock the body members together against dis-engagement, and a flexible hose unit comprising a flexible protective sleeve, a plurality of hoses in side by side arrangement within the sleeve and the two second parts of the two part couplings, the second body members being securely attached to the two ends of the flexible protective sleeve and each hydraulic connection within a second body member being attached to a hose end whereby when the hose unit is coupled to the two machine members the hoses establish separate hydraulic flow paths between the internal passages of the two machine members and a flexible mechanical connection between the machine members is formed by the body members, the locking members and the flexible protective sleeve.

3,911,795
PISTON AND CYLINDER APPARATUS

Peter Frederick Gibbons, Bristol, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed Nov. 20, 1973, Ser. No. 417,618
Claims priority, application United Kingdom, Dec. 9, 1972, 56939/72
Int. Cl.² F01B *7/00*; F16J *9/00*
U.S. Cl. 92—63 **5 Claims**

1. A piston and cylinder actuator comprising a piston slidable within a cylinder, piston sealing ring means carried by the piston for sealing between the piston and the cylinder to prevent passage of fluid from one side of the piston to the other when there is a difference of pressure across the piston, circumferential retaining means formed in the piston circumference, and piston spacing means carried by said circumferential retaining means and bearing against the cylinder wall for guiding and centralizing the piston in the cylinder and protecting said sealing ring against side loads on the piston, said piston spacing means comprising a piston spacing ring of synthetic polymeric material and which is of generally tubular section with a hollow interior and itself resiliently deformable

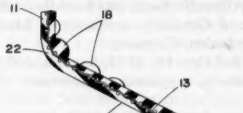


when engaged between and contacting the piston and cylinder to adapt to the dimensions of the bore of the cylinder.

3,911,796
DIAPHRAGM

Charles R. Hull, Aurora; George E. Heikes, Jr., Denver; Maurice W. MacBeth, Lakewood; Ronald E. DiFrancia; Claude L. Henderson, both of Denver, and Harlan E. Cluphf, Littleton, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Continuation of Ser. No. 331,906, Feb. 12, 1973, abandoned.
This application Aug. 19, 1974, Ser. No. 496,679
Int. Cl.² F01B *19/00*; F16J *3/00*
U.S. Cl. 92—101 **4 Claims**



1. In a fluid actuator system having a flat follower plate fully engaging all of a flat interior top planar surface of a dish shaped flexible diaphragm said diaphragm comprising:
a flange;
a top planar surface;
an annular sidewall connecting said flange and top flat planar surface; and
a multitude of raised buttons to engage the follower plate in the actuator system, said button disposed over the interior surface of a shoulder area consisting of a curved connecting portion between said top flat planar surface and said annular sidewall and said buttons also disposed on the interior surface of the immediately adjacent annular portions of said top flat planar surface and said annular sidewall connected to said shoulder area in order to accommodate misalignment of the follower plate as it coacts with the buttons on the inner surface of the shoulder area of the diaphragm.

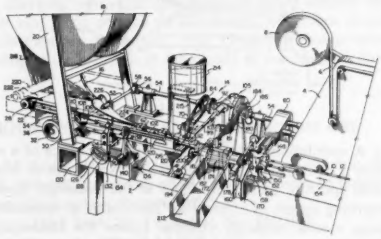
3,911,797
APPARATUS FOR MAKING CIGARETTE FILTER TUBES

Arnold Kastner, 10220 Armand Lavergne, Montreal, Quebec, Canada

Filed Feb. 13, 1974, Ser. No. 442,108
Claims priority, application Canada, Oct. 30, 1973, 184642/73
Int. Cl.² A24C *5/50*
U.S. Cl. 93—1 C **11 Claims**

1. Apparatus for producing cigarette paper filter tubes comprising an assembly for continuously forming a cigarette

paper into a hollow elongate tube and means for sequentially cutting cigarette tube lengths from an advancing leading end of the hollow elongate tube, and apparatus for forming and inserting a plug of filter material sequentially into one end of the cigarette tube lengths, and clamping means for holding the cigarette tube lengths during insertion of the plugs of filter material, the apparatus for forming and inserting a plug of filter material consisting of an indexed intermittently moving endless belt carrying and advancing filter material, the endless belt advancing the filter material in the form of a rope or tow incremental distances equal to a desired length of a plug of filter material, and severing means for sequentially severing filter plugs of equal and constant length from a leading end of the filter rope or tow, the leading end of the filter rope or tow being received within a bore in a stationary block prior to its



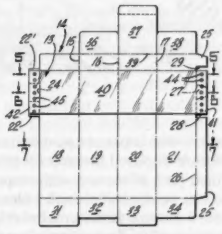
being severed into a filter plug, intermittent movement of the leading edge of the filter rope or tow advancing a severed plug of filter material from the bore in the stationary block into an axially aligned bore in a transfer block, the transfer block being reciprocally movable to a lateral position wherein its bore is in axial alignment with a clamped cigarette tube length, and a reciprocally movable filter plug advancing rod operable to push a filter plug from the transfer block into an end of a hollow filter plug injection nipple in axial alignment therewith, the hollow filter plug injection nipple being mounted on a reciprocally movable injection nipple rod with forward movement of the injection nipple rod moving the injection nipple into a clamped cigarette tube length, and restraining means to hold one plug of filter material within the cigarette tube length during retraction of the said injection nipple.

3,911,798

IDENTIFICATION BAND APPLICATION METHOD

Andrian Alan Whyte, Bardonia, N.Y., assignor to Schenley Industries, Inc., New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,434
Int. Cl.² B31B *49/02*
U.S. Cl. 93—36.6 **5 Claims**



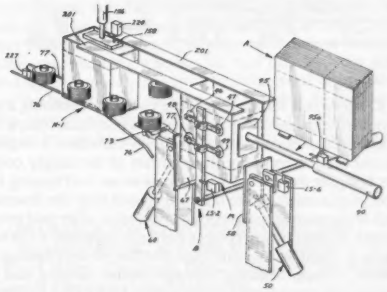
1. A method for sealing ends of an identification band to selected areas of a carton blank and providing fixed blank to blank and band to band seals in the carton erected from said blank, said blank being generally rectangular sheet having fold and cut lines formed therein and defining a plurality of centrally located and adjacent body panels having end forming flaps at opposite ends thereof, and at least one glue flap or tab along one of said body panels, said process comprising serially perforating said identification band along predetermined margins thereof selectively spaced from opposed ends of said identification band, said perforations being longitudinally arranged on each margin of said band and respective series of said perforations located in said margins proximate opposed ends of said band being substantially parallel, extending said identification band transversely across said body panels of said carton blank in overlying relationship to said outer surface thereof, applying glue to said at least one glue flap or tab providing along one of said body panels of said carton blank, affixing a perforated margin of an end of said identification band to said glue flap or tab so as to permit glue applied thereon to leak through said perforations arranged on said identifications band margin, adhesively affixing said other perforated margin of said identification band to said carton blank so as to permit said adhesive to leak through said perforations provided in said margin of said other end of said identification band, said affixed identification band being transversely located across said outer surface of said body panels of said carton blank and being free from said body panels thereof, and erecting said carton blank with said affixed identification band to form a carton therefrom with said opposed perforated margins of said identification band being in face to face adhesive engagement, opposed portions of said carton blank underlying adhesively affixed opposed perforated ends of said identification band being adhesively connected, one to the other in the erect carton.

3,911,799

BOX POSITIONING AND TRANSFER MECHANISM

Robert N. Klund, Stillwater, Minn., assignor to Delkor Industries, Inc., Minneapolis, Minn.

Continuation of Ser. No. 339,729, March 9, 1973, abandoned.
This application July 12, 1974, Ser. No. 488,044
Int. Cl.² B31B *1/76, 5/02*
U.S. Cl. 93—53 R **9 Claims**



1. A carton erecting mechanism comprising:

a magazine for storing a plurality of collapsed folding cartons;

suction cup means for removing one of said collapsed folding cartons from said magazine and opening said collapsed folding carton at a first work station;

first piston and cylinder means with the piston movable along an axis having a vertical component for pushing the minor flaps of said carton into a closed position while the carton is located at said first work station;

second piston and cylinder means for pushing the carton from said first work station;

carton transfer means comprising a plurality of pairs of rollers arranged, when driven, to transport a box inserted at one end along a transfer path, one end of said box transfer means being arranged adjacent to said first work

station to receive said carton from said second piston and cylinder means;

means constructed and arranged to control said second piston and cylinder means to push the box from said first work station to insert it into one end of said carton transfer means after said first piston and cylinder means has closed the minor flaps of said carton;

means for driving said pairs of rollers of said carton transfer means when the carton is inserted at one end of the transfer path to propel the carton until it reaches a second work station, said pairs of rollers supporting said carton at said second work station;

means for performing carton assembly operations at said second work station; and

means for driving said pairs of rollers of said carton transfer means after completion of carton assembly operations at said second work station to remove the carton from said second work station.

3,911,800

APPARATUS FOR FORMING LOOSE PACKETS CONTAINING A PREDETERMINED NUMBER OF FLAT WORK PIECES

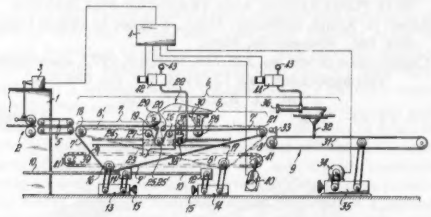
Richard Feldkamper, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Mar. 5, 1974, Ser. No. 448,198

Claims priority, application Germany, Mar. 8, 1973, 2311541

Int. Cl.² B31B *1/98*

U.S. Cl. 93—93 HT **13 Claims**



1. Apparatus for forming loose packets containing a predetermined number of superposed flat workpieces from a row of said workpieces delivered by a supply conveyor, comprising a slower second conveyor downstream of the supply conveyor for bringing the row of workpieces to an overlapping formation, displaceable brake means disposed near the downstream end of the second conveyor and operative, after said predetermined number of workpieces has been supplied, so as temporarily to build up and interrupt the flow of overlapping workpieces, a reciprocatable carriage means carrying said brake means and comprising locking means for locking said carriage means to said second conveyor so that said carriage means moves with said second conveyor, a conveyor direction changing means establishing the length of said second conveyor, a third conveyor downstream of the second conveyor and movable faster than said second conveyor, and a packeting station downstream of the third conveyor, the packeting station comprising an abutment extending transversely to the direction in which the workpieces are fed from the third conveyor, wherein, during said build-up of overlapping workpieces on the second conveyor, the carriage means having said brake means and said conveyor direction changing means thereon being displaced in the downstream direction at the same speed as the feeding speed of the second conveyor, whereby said brake means is displaced and the conveying run of the second conveyor is extended in the downstream direction at the same speed as the feeding speed of said second conveyor.

3,911,801

VENTILATING SYSTEM FOR PASSENGER SPACE OF A VEHICLE, ESPECIALLY OF A MOTOR VEHICLE

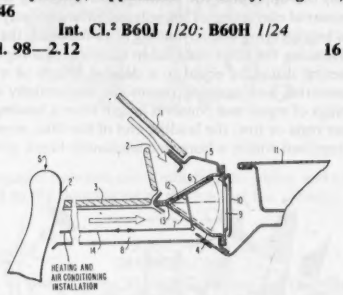
Albert Stolz, Tubingen-Pfrondorf, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 15, 1973, Ser. No. 388,659

Claims priority, application Germany, Aug. 17, 1972, 2240446

Int. Cl.² B60J *1/20*; B60H *1/24*

U.S. Cl. 98—2.12 **16 Claims**



1. A ventilation system for the passenger space of a vehicle which is provided within its rearward area with at least two access aperture means provided in the passenger space for permitting access of exhaust-air therefrom, a ventilation discharge means, separate channel means for connecting the respective access aperture means with said ventilation discharge means, at least one exhaust-air discharge aperture means connected with said ventilation discharge means for discharging the exhaust air, characterized by means for changing the flow resistance of air paths leading to the exhaust-air discharge aperture means in dependence on selectable operating conditions by permitting air to selectively flow from at least one of said access aperture means or simultaneously from both of said access aperture means to said exhaust-air discharge aperture means.

3,911,802

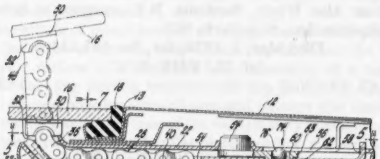
CLOSURE ASSEMBLY AND ACTUATOR

Russell L. Morden, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,598

Int. Cl.² B60H *1/26*; E05F *11/00*

U.S. Cl. 98—2.14 **3 Claims**



1. In combination with a panel member having an aperture therein and a closure disposed thereon for pivoted movement in a predetermined path of motion with respect to said panel member between an open position and a closed position closing said aperture, a closure actuator assembly comprising, in combination, a housing rigidly supported on said panel member generally adjacent a marginal edge of said aperture, a moveable member, means supporting said movable member on said housing for linear bodily slidable movement along a predetermined linear path of motion in a plane parallel to a plane of said aperture, rotary input drive means disposed in

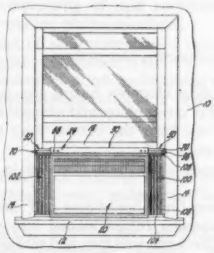
said housing in a plane parallel to the plane of said aperture and being connected to said moveable member for effecting bodily shiftable movement of the latter in response to a rotary input thereto, a drive element flexible in only one direction and operative for force transmission in compression, means attaching one end of said drive element to said closure so that said one end is constrained for movement in the path of motion of said closure and substantially perpendicular to the plane of said aperture, means attaching the other end of said drive element to said moveable member so that said other end is constrained for movement in the path of motion of said moveable member, and guide means disposed on said housing between said moveable member and said aperture defining a guide portion extending across said marginal edge and including a first section aligned along the path of motion of said one end of said drive element and a second section aligned along the path of motion of said other end and a curved transition section therebetween, said drive element being slidably disposed in said guide portion so that bodily movement of said moveable member places said drive element in compression for moving said closure from the closed to the open position.

3,911,803

MOUNTING ARRANGEMENT FOR ROOM AIR CONDITIONER

Carlito M. Kong, Dayton; William E. Koeppen, Kettering, and Jim L. Brandt, Bradford, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 25, 1974, Ser. No. 509,092
Int. Cl.² E06B 7/02
U.S. Cl. 98—94 **3 Claims**



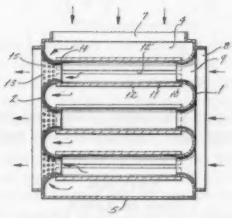
1. In an air conditioning apparatus, means for mounting a room air conditioner casing within a window frame structure having a vertical sliding sash, top and bottom channel assemblies secured to the top and bottom walls of said casing, respectively; means for securing said bottom channel assembly to the sill of the window frame wherein the improvement in said top channel mounting assembly comprising, a top channel member coextensive with the transverse dimension of the casing having an upright channel defined by a base and inner and outer vertical side wall flanges, means securing said base to said casing top wall, an integral upwardly projecting extension outwardly offset from the plane of said inner side wall flange, said extension having an inwardly directed horizontally disposed rib for engagement with the indoor face of the window sash; a pair of identical double-L section members, one disposed in nested relation to extend outwardly from each end of said top channel member; each said double-L member having a horizontal web connecting vertically extending top and bottom legs, said double-L member positioned with said top leg in flush relation with the inner surface of said top channel extension and with said bottom leg seated adjacent said top channel outer side wall flange, said double-L section member having its right-angled juncture between said top leg and said web in conforming juxtaposed relation with the offset bend portion of said top channel extension, adjustable means for securing said pair of double-L section members to said top channel extension in a position whereby the free end of each double-L member contacts its associated window frame vertical jamb, and a pair of cantilevered screw bushings, one being positioned on each of the vertical jambs in coaxial opposed relation so as to contact the free end portion of its associated double-L section member at said web and top leg right-angled juncture to thereby secure the upper portion of the air conditioner cabinet in the window frame whereby the window sash may be freely raised and lowered in the window frame portion above the installed room air conditioner.

3,911,804

AIR MIXING DEVICE

William K. Y. Tao, 9960 Holliston Court, St. Louis, Mo. 63124

Filed May 20, 1974, Ser. No. 471,213
Int. Cl.² B01F 15/00; F24F 7/00
U.S. Cl. 98—38 A **16 Claims**



1. An air mixing device for use in air conditioning systems comprising means defining a chamber having an upper portion, a lower portion, side portions, and front and rear portions, there being a first air inlet in said upper portion, there being a first air outlet in said rear portion, at least one open-ended duct with a side wall between its ends provided within said chamber and extending from said front portion to said rear portion and opening at its respective ends therethrough, the forward end of said duct constituting a second air inlet, the rearward end of said duct constituting a second air outlet, and said duct having an opening in its side wall between its ends and within said chamber whereby air may flow between said duct and said chamber responsive to differential of pressure between the bodies of air entering said chamber through said first and second air inlets for effecting an equalization of pressure in the air emitted through said first and second air outlets.

3,911,805

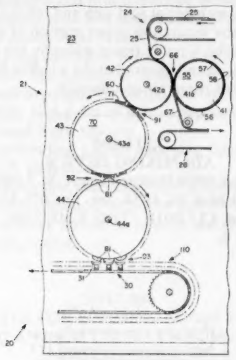
APPARATUS FOR CUTTING, SHAPING AND TRANSFERRING FLEXIBLE PREFORMS

James Clark Baird, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 24, 1974, Ser. No. 536,148
Int. Cl.² A21C 11/10; A47J 37/00
U.S. Cl. 99—353 **11 Claims**

1. An improved cut-and-transfer apparatus including rotary cutting means and a flight of molds for cutting preforms having an as-cut shape from a flexible web and for transferring each of the preforms to a said mold having a final shape substantially different from said as-cut shape, said improvement comprising means intermediate said cutting means and said flight of molds for incrementally reshaping the preforms from said as-cut shape to said final shape, said means for incrementally reshaping comprising at least one shaping-transfer cylinder having an array of intermediate-shape members on its periphery, each of said members having a radially outwardly oriented face of a shape intermediate said as-cut shape and said final shape, said apparatus further comprising means for

rotating said cylinder in timed relation with said cutter means and said flight of molds, means for transferring said performs



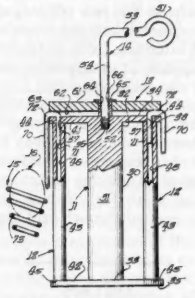
to said faces adjacent said cutter means, and means for transfering said performs from said faces to said molds.

3,911,806

EGG HOLDER

Everett C. Thomison, 5426 Virginia Ave. Box 109, Los Angeles, Calif. 90029

Filed Nov. 29, 1974, Ser. No. 528,090
Int. Cl.² A47J *29/06*
U.S. Cl. 99—411 **6 Claims**



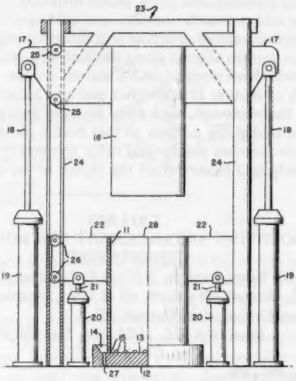
1. An egg holder for boiling eggs in a pan full of water, the egg holder comprising, in combination:
a base forming core member;
a plurality of supporting tubes affixed to said base member; said base member having a portion thereof extending above the upper ends of said tubes,
a handle member removably affixed to said base member portion;
a washer member slidable along a portion of said handle member between a position adjacent said base member portion and a position spaced from said base member portion; and
a plurality of separate egg holding baskets each having a support arm and each said arm adapted to be mounted at spaced locations about said base member portion and extend outwardly and downwardly therefrom to support an egg therein for cooking, said washer member being adapted to overlie said arms and said base member portion to retain the baskets on said base member portion.

3,911,807

REFUSE COMPACTOR AND METHOD

Bruce H. Birnbaum, 13540 Youngwood Turn, Bowie, Md. 20715

Filed Dec. 10, 1973, Ser. No. 423,340
Int. Cl.² B30B *15/32, 9/04*
U.S. Cl. 100—37 **5 Claims**



1. A refuse compactor, comprising:
a base;
an upright hollow chamber having top and bottom open ends devoid of cover plates and adapted to rest on the top surface of said base, the bottom edge of said chamber being scalloped;
a ram positioned above said chamber in axial alignment therewith;
hydraulic means for reciprocating said ram relative to said chamber whereby refuse loaded into said chamber is compacted between said ram and said base and whereby waste liquids present in the refuse are expelled through the openings formed between the bottom scalloped edge of said chamber and the top surface of said base; and
second hydraulic means for vertically moving said chamber upwardly or downwardly relative to said base and said ram.

2. In a refuse compactor having an upright open-ended hollow chamber adapted to rest on a base and a vertically slidable ram positioned above said chamber and in axial alignment therewith, the method of compacting the refuse comprising:
loading said chamber with refuse;
compacting the refuse within said chamber with said ram; then
raising said chamber with the refuse compacted therein to a position above said base; then
placing a disposal container arounds said refuse compacted chamber between said base and the bottom end of said chamber while said chamber is raised; then
lowering said refuse compacted chamber with said disposal container therearound until said container contacts said base;
moving said ram downwardly to a position in contacting relation to the top surface of the compacted refuse; and then.
moving said chamber upwardly while said ram is in the downward position thereby ejecting the refuse into said container for disposal.

3,911,808

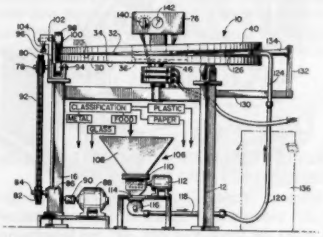
METHOD FOR PROCESSING FOOD WASTES

Rush E. Lassiter, Hammond, and Floyd S. Saizon, Baton Rouge, both of La., assignors to Floyd Rush Corporation, Baton Rouge, La.

Division of Ser. No. 348,636, April 6, 1973, Pat. No. 3,858,505. This application Oct. 24, 1974, Ser. No. 517,491

Int. Cl.[2] B30B *15/34*

U.S. Cl. 100—38 8 Claims



1. A method of continuous processing of refuse, said method comprising:

comminuting raw refuse;

continuous placement of comminuted refuse between rotating platen members of a refuse processing machine;

continuous compressing of said comminuted refuse between said rotating platen members;

continuous heat of said comminuted refuse disposed between said platen members; and

continuous removal of dried comminuted refuse from said platen members during rotation of said platen members.

3,911,809

COUNTER PRESSURE MEANS FOR A SCREW PRESS

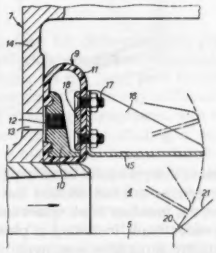
Erlend Eikenes, Oslo, Norway, assignor to Thune-Eureka A/S, Oslo, Norway

Filed Oct. 9, 1974, Ser. No. 513,508

Claims priority, application Norway, Nov. 27, 1973, 4518/73

Int. Cl.[2] B30B *15/00*

U.S. Cl. 100—148 2 Claims



1. Counter pressure means for a screw press, characterized by a number of flaps swingably arranged in radial planes along the circumference of the press discharge end, which flaps are mounted on a common annular bellows means to be connected to a source of pressure.

3,911,810

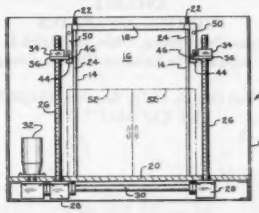
BALING MACHINE

Wilbur R. Standbridge, Ann Arbor, Mich., assignor to Ann Arbor Baler Company, Ann Arbor, Mich.

Filed May 23, 1974, Ser. No. 472,669

Int. Cl.[2] B30B *1/18*

U.S. Cl. 100—290 2 Claims



1. Compactor apparatus comprising a container having a floor, a platen movable downwardly in said container toward said floor, means for moving said platen downwardly comprising a pair of upright screws disposed at opposite ends of said platen, drive means for rotating said screws, means drivingly connecting each of said screws to one end of said platen comprising a nut threadably mounted on the screw, a plate secured to said nut and having a notch formed therein at a position to one side of said nut, an upright arm positioned in said notch and secured at the lower end thereof to said plate at said notch, said arm being secured at its upper end to one end of said platen so that downward forces applied to said nut by said screw are transmitted through said arm to said one end of said platen.

3,911,811

MACHINE FRAME, ESPECIALLY FOR PRESSES

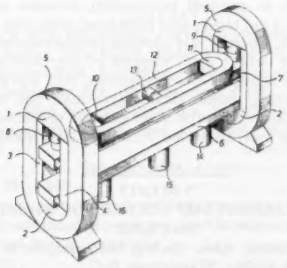
Rune G. Adolfsson, Boras, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Oct. 15, 1974, Ser. No. 515,089

Claims priority, application Sweden, Oct. 18, 1973, 73141616

Int. Cl.[2] B30B *15/06*

U.S. Cl. 100—295 15 Claims



1. A machine frame for imparting treatment forces to a workpiece comprising:

workpiece receiving means (6) for receiving a workpiece;

an elongate beam (7) spaced from said receiving means (6);

means (8, 9) for moving said elongate beam (7) relative to said workpiece receiving means (6) to apply said treatment forces to a workpiece located between said elongate beam (7) and said workpiece receiving means (6), said elongate beam which, when acting upon a workpiece

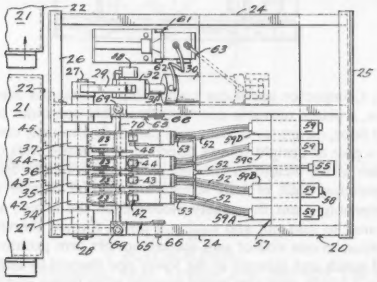
under treatment in the maching being subjected to reactional forces tending to deform said elongate beam (7); and

at least one biasing winding means (12) coupled to said elongate beam (7) and arranged to generate forces tending to keep said elongate beam (7) compressed in its longitudinal direction.

3,911,812
PRINTING APPARATUS

William T. Flynn, Perrysburg, Ohio, and Erich L. Wolf, Riverside, Calif., assignors to Reliance Electric Company, Pepper Pike, Ohio

Filed Oct. 5, 1973, Ser. No. 404,007
Int. Cl.² B41J *7/70*
U.S. Cl. 101—1 **9 Claims**



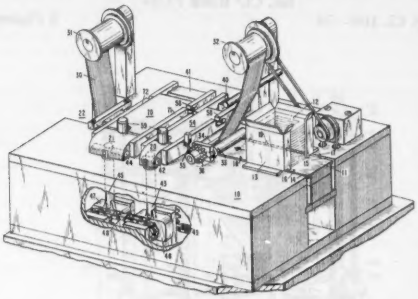
1. Printing apparatus for printing characters on a surface comprising, in combination, at least one pivotally mounted print head assembly mounted on a pivot shaft, said print head assembly having a print head mounted thereon, said print head including a plurality of die segments defining a printing surface and movable between a rest position and a printing position, means for moving preselected ones of said die segments between the rest position and the printing position, inking means for applying ink to said preselected ones of said die segments and means for moving said print head in an arcuate path into printing relationship with such surface, said print head assembly defining a parallelogram comprising a pivot block mounted on said pivot shaft, a top block spaced from said pivot block, and a pair of spaced flexure members extending, in an opposed relationship, between said pivot block and said top block, said print head supported adjacent said top block, whereby said opposed flexure members of said parallelogram deflect upon rotation of the pivot shaft and move the die segments into engagement with a printing surface, said inking means including at least one ink roller mounted adjacent said print head and cam means for moving said ink roller away from said print head after inking is completed.

3,911,813
REMOVABLE STAMP HOLDER FOR STAMPING MACHINE

Nerle J. Schaeffer, Silver Spring, Md., assignor to National Geographic Society, Washington, D.C.

Filed Sept. 9, 1974, Ser. No. 504,284
Int. Cl.² B41F *17/00*
U.S. Cl. 101—43 **2 Claims**

1. A stamping machine of the type having a frame including a bed along which articles to be stamped are intermittently advanced to be momentarily positioned at at least one stamping station, the stamping assembly at each station comprising, a stamp holder pivotally connected at one end to said frame on one side of said bed in a manner to extend transversely of said bed above the path of movement of the articles on said bed and to be movable to and from said bed, means connected to the other end of said holder opposite said pivotally connected one end for reciprocating said holder to and from said bed for stamping an article positioned on the bed beneath said holder, each said holder having two spaced apart side members extending between its ends, means to removably secure a stamp head in each holder in stamping position between each of said side members and comprising an L-shaped pivot slot in each side member formed with an upwardly extending

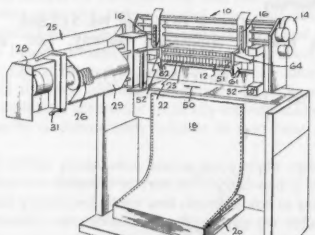


portion, and pivot pins extending from opposite sides of the stamp head and adapted to be removably received through the upwardly extending slot portions into respective ones of said pivot slots, whereby the head may be received in stamping position between said side members with the pins received in the slots and may be pivoted out of stamping position between said side members and removed with the pins removed through the upwardly extending slot portions.

3,911,814
HAMMER BANK MOVE CONTROL SYSTEM

Clifford J. Helms, Calabasas Park; Donald K. Skinner, and Donald G. Stupeck, both of Canoga Park, all of Calif., assignors to Data Products Corporation, Woodland Hills, Calif.

Filed May 15, 1974, Ser. No. 470,269
Int. Cl.² B41J *9/12*
U.S. Cl. 101—93.16 **17 Claims**



1. A hammer bank system useful in an impact printer of the type including a printer control section for controlling the printer operation, the hammer bank system comprising:

a movable hammer bank including a plurality of spaced apart individually actuatable hammers;

drive means coupled to said bank for driving the bank in either a first direction or a second opposite direction; and control means responsive to a hammer bank command signal from said printer control section for controlling said drive means to drive said hammer bank in said first direction, when the hammer bank is at a first selected position, to a second selected position, and to drive said hammer bank in said second direction, when said ham-

mer bank is at said second position, to the first position, said control means including output means for applying a move complete signal to said printer control section when the movement of said hammer bank from one of the positions to the other in response to the hammer bank command signal is completed, said control means further include positioning means for providing an analog position signal of zero amplitude with respect to a reference level when said hammer bank is at either of said positions, said position signal amplitude being of a first polarity with respect to said reference level when the hammer bank is between said positions within a preselected distance from said first position, and is of a second polarity, opposite said first polarity, when the hammer bank is between said positions and wthin said preselected distance from said second position.

3,911,815
MECHANISM FOR DAMPENING THE PRINTING PLATE OF AN OFFSET PRINTING PRESS

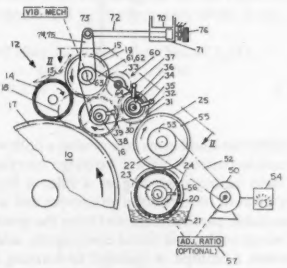
Hartwig Banfer, Wiesbaden, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Continuation of Ser. No. 355,447, April 30, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,464

Claims priority, application Germany, May 2, 1972, 2221423

Int. Cl.² B41F *31/14, 7/26, 7/32*

U.S. Cl. 101—148 **10 Claims**



1. In a mechanism for dampening the plates on the plate cylinder of an offset printing press, the combination comprising means defining an ink feed path including an ink feed roller and an associated resiliently surfaced ink form roller, the latter being in rolling engagement with the plates, means defining a water feed path including a resiliently surfaced fountain roller, a hydrophilic hard surfaced water feed roller and a resiliently surfaced transfer roller, the latter being in rolling engagement with the ink form roller, means for driving the ink feed roller and transfer roller at press speed, means for driving the water feed roller at a variable peripheral speed which differs from press speed so that slippage takes place between the water feed roller and the transfer roller thereby to vary the rate of water feed to the transfer roller, means defining a separate sub-frame upon which the form roller and transfer roller are mounted and which is swingable about the axis of the ink feed roller from an active position to a retracted position for disengaging the form roller from the plates and for disengaging the transfer roller from the water feed roller to cut off further feeding of water.

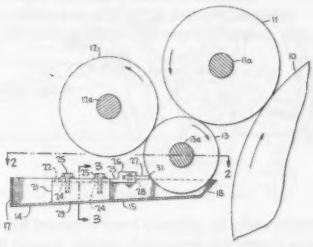
3,911,816
WIPER BLADE ASSEMBLY FOR ROLLER FOUNTAIN DAMPENER

Ralph E. Hutton, Java Center, and R. Kent Hilborn, Cheektowaga, both of N.Y., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,022

Int. Cl.² B41F *7/32*

U.S. Cl. 101—148 **3 Claims**



1. In a printing press having an elongated fountain for containing dampening fluid, said fountain having a bottom wall and spaced upstanding side walls and end walls, a transfer roller located above said fountain for transferring dampening fluid to a printing surface, said transfer roller extending between said side walls and having its opposite ends located inwardly thereof, said transfer roller being rotatable about an axis parallel to the longitudinal axis of said fountain, wiper blade assemblies mounted in said fountain at one side of said roller, each said assembly comprising supports fixedly mounted on the inner surface of said bottom wall adjacent each said side wall, arm members mounted on said supports for movement toward and away from said roller, and elastomeric wiper blades secured to said arm members and extending toward said roller, said blades having free edges lying parallel to said roller axis and extending therealong from said opposite ends of said roller toward the center thereof, said edges together having a length substantially less than the length of said roller, whereby said wiper blades are capable of wiping the surface of said roller adjacent said ends thereof to thereby control movement of the dampening fluid at said ends thereof.

3,911,817
DEVICE FOR PRINTING AND DISPENSING LABELS

Werner Becker, Hirschhorn; Heinz Kistner, Neckarsteinach, and Heinrich Volk, Beerfelden, all of Germany, assignors to Dymo Industries, Inc., San Francisco, Calif.

Filed Aug. 22, 1974, Ser. No. 499,790

Claims priority, application Germany, Sept. 7, 1973, 2345249

Int. Cl.² B65C *11/00*

U.S. Cl. 101—288 **6 Claims**

1. A device for printing and dispensing labels carried on a label strip advanced in predetermined increments through the device, said device comprising:

a frame;

a printing platen on the frame;

advancing means on the frame for advancing the label strip relative to the platen;

a primary lever mounted on the frame for pivotal movement between a rest position and a depressed position;

a primary spring biasing the primary lever toward the rest position;

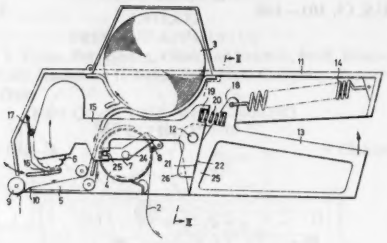
a secondary lever mounted on the frame for pivotal movement between a first position and a second position;

a printing mechanism carried by the secondary lever, said printing mechanism being located away from the printing platen when the secondary lever is at the first position and

being located against the printing platen when the secondary lever is at the second position;

means biasing the secondary lever toward the first position with a predetermined maximum force; and

a secondary spring coupling the primary lever with the secondary lever such that the secondary lever will remain



stationary while the primary lever is moved from the rest position toward the depressed position, against the bias of the primary spring, until the force of the secondary spring overcomes the maximum force of the biasing means to move the secondary lever from the first position to the second position thereof.

3,911,818

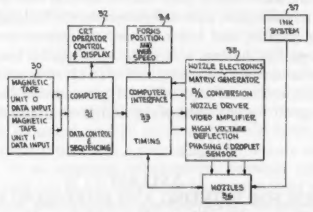
COMPUTER CONTROLLED INK JET PRINTING

Donald A. MacIlvaine, Lockport, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,208

Int. Cl.[2] B41L *47/46*

U.S. Cl. 101—426 **19 Claims**



1. A printing system wherein variable alpha/numeric data is printed in registered and aligned relationship with fixed data printed by a master plate cylinder on a moving web at press speeds, comprising:

means for providing coded data representative of said variable data in a selected multiple line message format and for providing command signals;

control means for receiving said coded data and responsive to said command signals for generating character timing signals representing the sequential position of said alpha/numeric data in said multiple line message format, and including means for automatically adjusting said character timing signals to account for different web speeds and variable form depth data, said means for automatically adjusting said character timing signals includes means for generating a top of form pulse for each revolution of said master cylinder, said top of form pulse occurring prior to the mechanical top of form of said master cylinder, means for generating first pulses having a pulse rate dependent on the speed of the web, and means for correcting said top of form pulse in accordance with said first pulses, said means for automatically adjusting said character timing signals being responsive to said corrected top of form pulse; and

means for printing said variable data in response to said character timing signals by the projection of independently controlled ink droplet streams onto said moving web.

3,911,819

ALUMINUM ALLOYS FOR LONG RUN PRINTING PLATES

Michael J. Pryor, Woodbridge; James A. Ford, North Haven, and Sheldon W. Dean, Hamden, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 18, 1974, Ser. No. 451,795

Int. Cl.[2] B41N *1/08*

U.S. Cl. 101—459 **9 Claims**

1. A lithographic printing plate having high fatigue strength suitable for long run printing plates made of an aluminum base alloy consisting essentially of from 0.2 to 0.75% magnesium, from 0.45 to 0.7% copper, from 0.1 to 0.7% iron, and the balance aluminum.

3,911,820

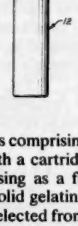
BULLET

Jack Y. Canon, 2194 Delmas, Opelousas, La. 70570

Continuation-in-part of Ser. No. 237,271, March 23, 1972, abandoned. This application Oct. 12, 1973, Ser. No. 405,781

Int. Cl. F42b *5/02*

U.S. Cl. 102—38 **23 Claims**



1. A bullet for small arms comprising a hollow missile casing for releasable coupling with a cartridge carrying a propellant charge, said casing enclosing as a filler a liquid ranging in viscosity upward to semi-solid gelatinous and a multiplicity of heavy insoluble particles selected from the group consisting of metals, metal oxides and metal compounds, said casing having an open end, a blunted or rounded tip forming a frangible seal with said open end, said heavy particles being at least as large as dust shot and being present in volume of 65 to 95% of said filler, said casing and tip being of such dimensions, materials and configurations as to constitute an integral bullet sized missile resistant to deformation or destruction during firing and until impact with a target to break said frangible seal and release said casing filler in the target.

3,911,821

PYROTECHNIC DEVICES, ESPECIALLY FOR SMALL CALIBER CARTRIDGES, WITH MECHANICAL PERCUSSION PRIMERS, AND MEANS FOR THEIR MANUFACTURE

Albert Finot, and Lucien Corbin, both of Le Mans, France, assignors to Etat Francais, France

Filed May 21, 1973, Ser. No. 362,344

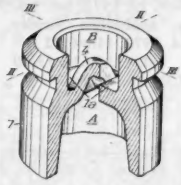
Claims priority, application France, June 14, 1972, 72.021311

Int. Cl.[2] F42B *5/28, 9/28*

U.S. Cl. 102—45 **4 Claims**

1. A casing for a mechanical percussion primer pyrotechnic device, comprising a casing body including a transverse wall which divides the casing body into a first, forward opening chamber adapted to house a pyrotechnic charge and a second,

rearwardly opening chamber adapted to house an explosive mechanical percussion primer for firing the pyrotechnic charge, said transverse wall including a central part which is partially cut from the remainder of the transverse wall and forced rearwardly with respect thereto so as to project into said second, rearwardly opening chamber, said transverse wall including slits therein which separate said central part from the remainder of the wall along at least two edges of the



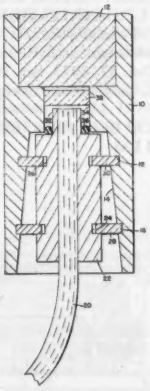
central part while leaving at least one portion of the central part which is connected to the remainder of the wall, a portion of the central part being separated from the remainder of said wall an amount sufficient to define an opening between a portion of at least one of said edges of said central part and the portion of the remainder of the wall which originally bordered that edge, said projecting central part constituting an anvil and said opening constituting a vent between said first and second chambers.

3,911,822

METHOD OF ATTACHING FIBER OPTICS BUNDLE TO LASER SQUIB

John L. Boling, Jefferson, La., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,252
Int. Cl.[2] F42C *19/00*
U.S. Cl. 102—70.2 R **3 Claims**



1. Means for connecting a fiber optic bundle to a propellant squib comprising,

a fiber optic bundle,

a tubular metal end piece fixed to the end of said fiber optic bundle,

annular grooves in the outer periphery of said tubular metal end piece,

snap rings mounted in said annular grooves,

a housing for said propellant squib having formed therein a frusto conical socket, and

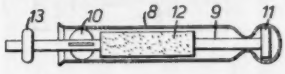
annular grooves formed in the wall of said socket and adapted to receive such snap rings.

3,911,823

PYROTECHNIC DEVICES

Dudley Charles Murray, Salisbury, and William Rupert Brooke Elstow, Laverstock, both of England, assignors to Pains-Wessex Limited, Salisbury, England

Filed July 27, 1973, Ser. No. 383,109
Claims priority, application United Kingdom, Aug. 1, 1972, 35969/72
Int. Cl.[2] F42C *19/08;* **F42B** *4/02*
U.S. Cl. 102—86.5 **15 Claims**



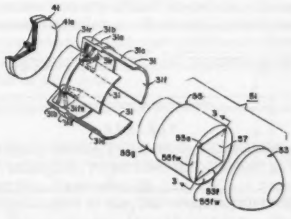
1. A pyrotechnic device which includes pyrotechnic composition and a percussion primer located therein for igniting said composition, wherein said pyrotechnic composition includes a fuel and a solid oxidising agent and said percussion primer is a photoflash-lamp-type primer comprising a tube having a wall deformable by striking the same, a rod-like anvil extending lengthwise in said tube, and a mass of sensitive primer composition supported on said anvil and spaced apart from the inside surface of said wall, said primer composition including phosphorus and a chlorate salt.

3,911,824

DETERRENT AMMUNITION PROJECTILE

Irwin R. Barr, Lutherville, and Paul L. Brown, Baltimore, both of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed July 13, 1973, Ser. No. 378,854
Int. Cl. F42b *13/20*
U.S. Cl. 102—92.7 **43 Claims**



1. Deterrent ammunition, comprising,

a projectile formed by a rupturable base housing section with a cross-sectionally polygonal cavity formed therein and having an annular bounding wall with longitudinally extending polygonal corners which are substantially weaker than interconnecting structurally reinforcing side wall sections between said corners,

a nose section closing said cavity at its forward end,

and a flowable dispersable material charge in said cavity for dispersal upon impact of said projectile with a target.

3,911,825

CASELESS FORMED PROPELLANT POWDER CHARGE

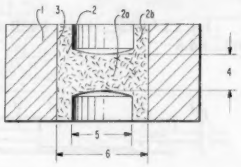
Heinz Gawlick, Furth/Bay, and Guenther Marondel, Erlangen, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Continuation of Ser. No. 163,173, July 16, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 445,896

Claims priority, application Germany, July 18, 1970, 2035851

Int. Cl.² F42B 1/00

U.S. Cl. 102—100 15 Claims



1. A caseless propellant charge for commercial apparatus not employing a projectile for driving studs and the like comprising a shaped propellant powder charge defining a hole of a given width extending therethrough, and a percussion-sensitive primer ignitor charge of substantially the same width as said defined hole and secured therein, said percussion-sensitive primer ignitor charge having an H-shaped cross section taken parallel to the axis of said hole with two substantially parallel legs extending in the axial direction of said hole and a transversely extending web interconnecting said two legs at points intermediate the end of said legs.

3,911,826

GOODS CONTAINERS

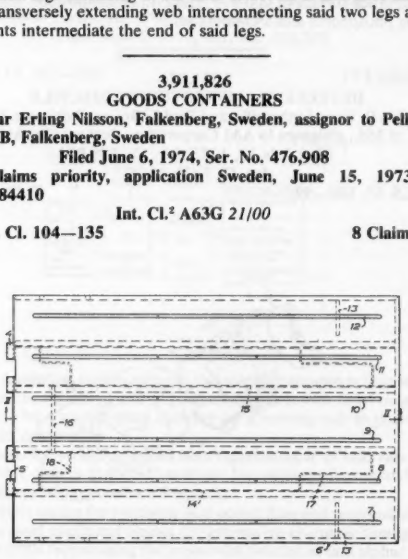
Alvar Erling Nilsson, Falkenberg, Sweden, assignor to Pelly AB, Falkenberg, Sweden

Filed June 6, 1974, Ser. No. 476,908

Claims priority, application Sweden, June 15, 1973, 73084410

Int. Cl.² A63G 21/00

U.S. Cl. 104—135 8 Claims



1. A container for carrying goods and adapted for movement along a roller track, which comprises at least one side wall and a rear wall, a hingedly supported bottom which can be pivoted upwardly against one of said rear and side walls, said bottom having on the underside thereof extended rails positioned for co-action with corresponding rollers of a roller track to accommodate movement of the container therealong, a plurality of wheel mounting plates connected to said bottom at respective corner regions thereof, sections of at least two of said rails extending in level relation with said wheel mounting plates whereby at least one of the rollers of the roller tract can co-act with at least one of said rails and at least one of said wheel mounting plates at the same time to facilitate entry of the container onto the roller track.

3,911,827

APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF A TRACK-GUIDED VEHICLE

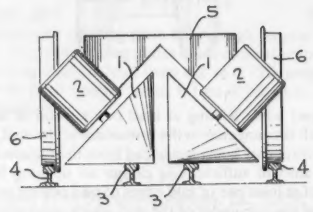
Johan Julius Jarnaker, Box 9, 776 00 Hedemora, Sweden

Filed Nov. 10, 1972, Ser. No. 305,361

Claims priority, application Sweden, Nov. 11, 1971, 14425/71; Sept. 14, 1972, 11846/72

Int. Cl.² B61B 13/00

U.S. Cl. 104—147 R 15 Claims



1. Apparatus for automatically controlling the speed of a vehicle guided along a track comprising at least one conical member mounted for rotation about a fixed axis on the vehicle, and speed regulating rail means disposed along the track and varying in distance from the track, said conical member contacting said speed regulating rail means with the point of contact with said speed regulating rail means varying with the varying distance of said speed regulating rail means from the track such that said speed regulating rail means contacts said conical member at points of decreasing diameter for decreasing speed and at points of increasing diameter for increasing speed.

3,911,828

LINEAR-INDUCTION MOTOR, E.G. FOR HIGH-SPEED MAGNETIC-LEVITATION VEHICLE

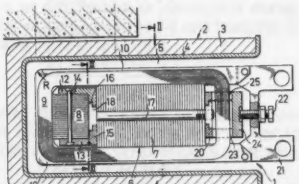
Peter Schwarzler, Furstenfeldbruck, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Dec. 17, 1973, Ser. No. 425,615

Claims priority, application Germany, Dec. 30, 1972, 2264293

Int. Cl.² B61B 13/08; H02K 41/02

U.S. Cl. 104—148 LM 17 Claims



9. An automatic-suspension vehicle system comprising a track formed with a reaction member having a generally U-shaped profile and composed of ferromagnetic material while being provided along each of its inner surfaces with an electrically conductive layer; and a vehicle magnetically suspended from said track and displaceable therealong, said vehicle being formed with a stator extending into said member and comprising a longitudinally divided core having at least two

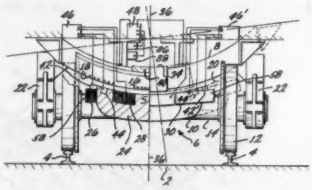
sheet stacks of different stacking directions, and annular coils encircling said core.

3,911,829

WHEELED VEHICLE MAGNETIC SUSPENSION SYSTEM

James A. Ross, La Jolla, and James A. Houdyshel, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sept. 25, 1974, Ser. No. 509,012
Int. Cl.² B61F *05/00*
U.S. Cl. 105—157 R **42 Claims**



1. An improved attractive magnetic suspension and vertical dampening apparatus for maintaining the sprung and unsprung portions of a surface supported vehicle in a spaced apart relationship at a predetermined gap length comprising:

an electromagnetic member carried by said sprung portion having a plurality of flux producing windings and at least one concave surface profile;

a ferromagnetic member carried by said unsprung portion having at least one convex surface profile overlaying said electromagnetic member for cooperation therewith; and

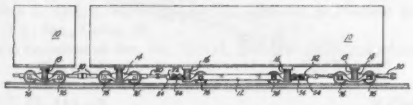
an active control means carried by said sprung portion responsive to any vertical movement of said sprung portion from an imaginary reference point fixed in free space and any change in the gap length from said predetermined gap length controlling the flux producing current through said windings simultaneously maintaining said predetermined gap length and dampening of vertical movement of said sprung portion.

3,911,830

PNEUMATIC ROLL STABILIZING SUSPENSION SYSTEM

Clarence R. Adams, 666 17th Ave. West, Kirkland, Wash. 98033

Continuation-in-part of Ser. No. 313,126, Dec. 7, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,180
Int. Cl.² B61F *3/08, 5/10, 5/24, 5/50*
U.S. Cl. 105—164 **8 Claims**



1. A railway vehicle suspension system for supporting a vehicle superstructure, comprising in combination:

a center truck pivotally connected between two guide trucks;

fluid springs mounted between each said truck and said superstructure;

means for sensing rate of horizontal turn mounted between said center truck and said guide trucks;

control means connected to said rate sensing means for determining superstructure tilt; and

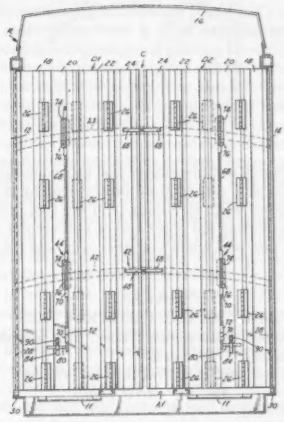
actuating means connected between said control means and said fluid springs for regulating fluid springs pressure in each said fluid springs, thereby causing superstructure tilting so that centrifugal forces combined with superstructure load result in a near normal gravity force being applied at the center of an associated track.

3,911,831

END DOOR FOR ENCLOSED RAIL CARS

Donald J. Blunden, Southfield, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Filed July 1, 1974, Ser. No. 484,424
Int. Cl.² B61D *19/00*
U.S. Cl. 105—378 **16 Claims**



1. An end closure for a rail car having upper and lower decks, comprising a foldable door, said door having a series of upright panels, means pivotally mounting the first end panel of the series at one side of the rail car adjacent one end thereof, means hinging all of said panels together so as to fold in overlying relation to one another and to unfold into substantially coplanar relation, said door being adapted to be disposed in closed position across the end of the rail car in the unfolded condition of said panels, means for securing said door in said closed position, said door being adapted to be disposed in open position in the folded condition of said panels with said panels swung inward about the axis of said pivotal mounting means along one side of the rail car, said upper deck having a recessed portion to clear said folded panels when they are swung inward to said open position as aforesaid, and means for substantially closing said recessed portion in the open position of said door.

3,911,832

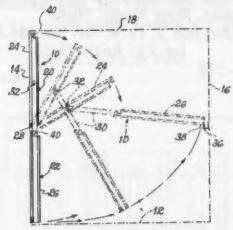
DECK STRUCTURE FOR VEHICLES

Buford E. Vandergriff, Naperville, Ill., assignor to Van Craft Industries, Inc., Naperville, Ill.

Continuation-in-part of Ser. No. 395,774, Oct. 12, 1973, abandoned. This application May 10, 1974, Ser. No. 468,662
Int. Cl.² B61D *3/06*
U.S. Cl. 105—372 **32 Claims**

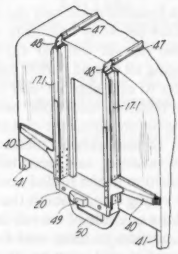
1. In a vehicle for transporting articles wherein a bed is provided for supporting the articles and including upstanding walls on opposite sides of the bed, the improvement comprising a collapsible deck having a first position extending horizontally over said bed between said side walls and a second position extending vertically relative to said bed adjacent one of said side walls, said deck including a first section, means pivotally connecting said first section to one side wall at a level spaced upwardly from said bed, and a second deck section, means pivotally connecting said second section to said first section at a position on said first section spaced away from said pivotal connection of said first section with said one side

wall, said second section extending from said level in a direction opposite the first section when the deck extends vertically, movement of said deck from said second position to said first position resulting from pivoting of said first section away



from said side wall and pivoting of said second section relative to said first section, said sections both extending on the same side of said level when said deck is in the first position, and means for supporting the outer end of said second section on the opposite side wall when said deck is in said first position.

3,911,833
RAIL CAR END CONSTRUCTION
Horace P. Bauer, Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.
Filed July 26, 1974, Ser. No. 492,363
Int. Cl.² B61D *17/06*
U.S. Cl. 105—402 **4 Claims**



1. End wall structure for railway passenger cars having an end wall with an end passage opening, end corner posts, and a buffer sill extending across the bottom of the end passage opening, comprising in combination therewith, a collision post secured to the buffer sill at each side of the end passage opening, and a lateral outrigger arm connected between each collision post and a corner post at a distance above the buffer sill, said lateral outrigger arm being located above the top of said buffer sill by a critical distance within which end frame collision impact of an adjacent car is likely to occur, and anchor reinforcing means for said collision post extending from the buffer sill to a height above said lateral outrigger arm.

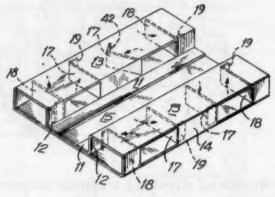
3,911,834
PALLET
Benjamin W. Quaintance, Overland Park, Kans., assignor to International Paper Company, New York, N.Y.
Filed Sept. 13, 1973, Ser. No. 396,786
Int. Cl.² B65D *19/34*
U.S. Cl. 108—57 **4 Claims**

1. A pallet which comprises:

a. a base constructed of corrugated sheet material which comprises,

i. a flat deck, the flutes of said corrugated sheet material being disposed transversely across said deck,

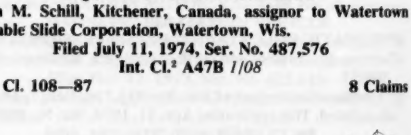
ii. a plurality of legs defining aligned, open, transverse channels therebetween and disposed adjacent to opposed longitudinal sides of said deck, each of said legs comprising an outer side wall foldably connected to said deck, a bottom wall foldably connected to said outer side wall, an inner side wall foldably connected to said bottom wall and at least one end wall foldably connected to one of said side walls, the corrugations in



said side walls being vertically disposed, and a retaining flap foldably connected to said end wall and disposed within the leg associated therewith, each of said end walls extending from one side wall to the opposite side wall and each of said end walls and each of said retaining flaps having a vertical height substantially equal to the vertical height of said side walls and each of said retaining flaps being in face abutting relation with respect to the adjacent side wall of the leg associated therewith, and

b. at least one sheet of foldable material wrapped longitudinally around said base and secured to the deck and bottom surface of said base.

3,911,835
EQUALIZER SLIDE ASSEMBLY
John M. Schill, Kitchener, Canada, assignor to Watertown Table Slide Corporation, Watertown, Wis.
Filed July 11, 1974, Ser. No. 487,576
Int. Cl.² A47B *1/08*
U.S. Cl. 108—87 **8 Claims**



1. An equalizer slide assembly, comprising a fixed central section, a pair of outer sections each disposed on opposite sides of the central section, connecting means for connecting each outer section to the central section for sliding longitudinal movement with respect to the central section, an endless cable, a pair of pulleys mounted on the central section and disposed to support the cable, each connecting means including a first connecting element secured to the outer section and a second connecting element secured to the central section and connected to said first connecting element, each connecting means also including a slide plate attached to one of said sections and disposed between the outer section and the central section, and attaching means for attaching the cable to said second connecting element of each connecting means, whereby extension and retraction of one of said outer sections

with respect to the central section will result in corresponding extension or retraction of the other outer section.

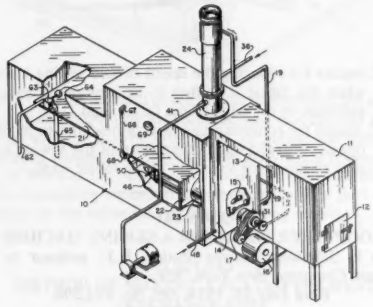
3,911,836
INCINERATOR AND SYSTEM FOR CLEANING PRODUCTS OF COMBUSTION

Kenard D. Brown, 1227 S. Willow St., Casper, Wyo. 82601

Continuation-in-part of Ser. No. 472,728, May 23, 1974, abandoned, which is a division of Ser. No. 231,148, March 21, 1972, Pat. No. 3,812,654. This application Aug. 12, 1974, Ser. No. 496,816

Int. Cl. F23g *5/00;* **F23j** *15/00*

U.S. Cl. 110—8 R **10 Claims**



1. An incinerator and combustion product cleaning system for burning sewage and other moist waste material and the like comprising:

means including a preheating chamber for heating and at least partially dring the moist waste to be burned;

means for supplying waste material to said preheating chamber;

means providing a combustion chamber;

means providing a passage for waste between said chambers and including a conveyor for moving heated waste from said preheating chamber into said combustion chamber; blower means for supplying combustion air to said combustion chamber; and,

means including a vacuum pump of the liquid vortex type for withdrawing gaseous matter from both of said chambers and for cleaning the withdrawn gas.

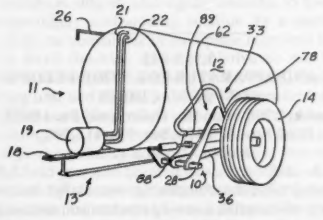
3,911,837
LIQUID FERTILIZER INJECTOR

Fred L. Quick, Williamsfield, Ill., assignor to Pearson Bros. Co., Inc., Galva, Ill.

Continuation of Ser. No. 83,911, Oct. 26, 1970, abandoned. This application Dec. 18, 1972, Ser. No. 316,015

Int. Cl. A01c *23/02*

U.S. Cl. 111—7 **4 Claims**



1. A manure spreader for injecting animal-manure slurry into the soil subsurface when drawn over the soil by a farm vehicle comprising:

a mobile tank assembly having a main longitudinal frame affixed at a forward end to the farm vehicle and at the opposite rear end having affixed thereto a plurality of tranversely spaced means for supporting said tank assembly and for engaging said soil to transmit at least a portion of the weight of said tank assembly for closing and packing furrows in the soil, a tank supported on said main frame, said tank having an outlet, and means to expel liquid manure from said tank through said outlet;

a plurality of furrow-forming assemblies;

a sub-frame secured to said main frame and extending along said main frame from a point adjacent said means for supporting and closing and packing forward therefrom to a point proximate said forward end of said main frame, a pivot bar rotatably mounted on said sub-frame transverse said main frame near said forward end of said main frame, a means for selectively rotating said pivot bar affixed between said pivot bar and said main frame, each of said furrow-forming assemblies having a beam extending rearwardly from said pivot bar, each of said beams having at a free end thereof a downwardly and forwardly inclined furrow-forming tool with a lower tip shaped to enter the soil, each of said beams, upon rotation of said pivot bar by said means for selectively rotating, being rotatable toward the soil to position said respective furrow-forming tool to enter the soil to a selected depth immediately forward of and in the line of travel of a respective one of said supporting and closing and packing means; and

a tube mounted downwardly behind each of said furrow-forming tools and having a downwardly facing opening close behind the respective tip of the tool, conduit means interconnecting said outlet of said tank and each of said tubes, said furrow-forming tools upon selective rotation of said pivot bar while the manure spreader is traveling forward providing respective deep furrows for receiving animal-manure slurry discharged from the respective ones of said tubes, and said means for supporting and closing and packing traveling over the furrow and caving the sides of the furrow to close and pack the soil over the slurry.

3,911,838
AUTOMATIC APPARATUS FOR MAKING PIPED OR WELTED POCKETS

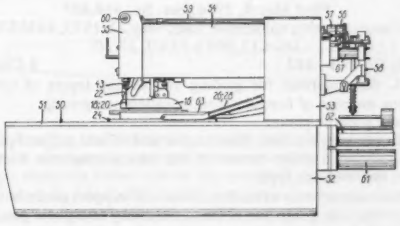
Luigi Nolli, Nieder-Roden, Germany, assignor to Necchi Societa per Azioni, Pavia, Italy

Continuation-in-part of Ser. No. 373,100, June 25, 1973, abandoned. This application June 28, 1974, Ser. No. 484,227

Claims priority, application Germany, June 24, 1972, 2230997

Int. Cl. D05b *3/04*

U.S. Cl. 112—70 **4 Claims**



1. In an automatic apparatus for folding, sewing and cutting a piped pocket on a sewing machine, a slidable support mounted on the bed of said apparatus and slidable along the sewing and cutting direction; a material presser connected to said slidable support for movement therewith; said material

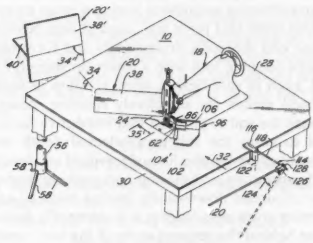
presser comprising first and second clamping bars; means independently mounting said bars to clamp a piece of pocket material onto said slidable support; drive means for operating said clamping bars a kinematic chain for each clamping bar independently connecting the first and second clamping bars with said drive means for moving said clamping bars individually and independently to and away from the material clamping position; and manual control means for controlling said drive means.

3,911,839

CONTOUR SEAMING SYSTEM AND METHOD

Abraham H. Waldman, 235 Albert Place, Elberon, N.J. 07740, and Sam Bernstein, 402 2nd Ave., Bradley Beach, N.J. 07720

Filed Mar. 18, 1974, Ser. No. 452,148
Int. Cl.² D05B *3/04*
U.S. Cl. 112—121.24 **17 Claims**



1. A contour seaming system for use with a sewing machine having a presser foot, a feed dog and a thread carrying needle, comprising:

a. means for contacting movable material for (1) angularly orienting said material in a predetermined direction and (2) inducing predetermined gravitational forces to said material;

b. means for adjusting the maximum lowering of said presser foot so that when said thread carrying needle enters said material said feed dog lowers and permits said material to pivot about said needle responsive to said gravitational forces induced by said material contacting means; and,

c. edge guide means for contacting an edge of said material.

3,911,840

GUIDE AND SEWING DEVICE FOR FABRIC LAYERS ALONG A SHAPED EDGE

Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi and C. S.p.A., Milan, Italy

Filed May 9, 1974, Ser. No. 468,457
Claims priority, application Italy, May 22, 1973, 24367/73
Int. Cl.² D05B *35/10, 27/10*
U.S. Cl. 112—153 **4 Claims**

1. An apparatus for guiding and sewing layers of fabric along an edge of irregular configuration comprising:

a. a support plane;

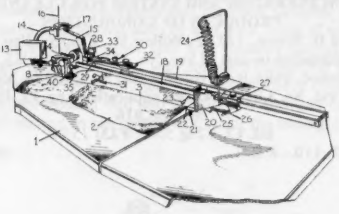
b. a sewing machine fixed to one end of said support plane having a drive motor of the electromagnetic friction brake-clutch type;

c. a support arm extending from said support plane having rotatable guide means carried thereby in a plane parallel with and spaced from said support plane;

d. means movable along said rotatable guide means for clamping the fabric and advancing the same toward said sewing machine along said support plane;

e. sensing means carried by said support plane for detecting variations in the edge of the layer of fabric to be sewn which includes:

1. means operatively connected to said sensing means for rotating said rotatable guide means and clamping means carried thereby so as to orient the position of the fabric as it is advanced to said sewing machine;



2. means for reducing the speed of said sewing machine when the fabric is shifted to accommodate an acute variation in the edge of the fabric; and

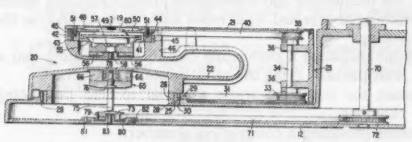
3. means for returning said sewing machine to its initial operating speed upon completion of the sewing in the area of the acute variation in the fabric edge.

3,911,841

LOOPTAKER DRIVE FOR A SEWING MACHINE

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,598
Int. Cl.² D05B *57/14*
U.S. Cl. 112—184 **5 Claims**



1. In a sewing machine having a bed, a bracket arm supported in overhanging relationship to said bed, an endwise reciprocatory needle carried in said bracket arm, actuating mechanisms imparting endwise reciprocation to said needle, a looptaker journaled in said bed in cooperative relationship with said needle, said looptaker having at least one loop taking beak, drive means carried in said bed and operatively connected to said actuating mechanism, at least one pair of magnetically interacting coupling elements for each loop taking beak, said magnetically interacting coupling elements including a driving element operatively connected to said drive means and a driven element united with said looptaker, said magnetically interacting coupling elements providing an operative stitch forming relationship between said looptaker and said needle in any possible locked relation between said driving and said driven magnet, said magnetically interacting elements being arranged in spaced relation having therebetween an air gap capable of accommodating work fabric being stitched.

3,911,842

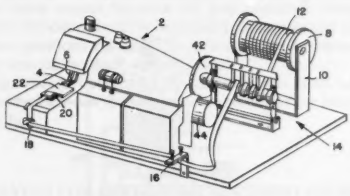
METHOD AND APPARATUS FOR STRIP FEEDING FOR SEWING MACHINES

George Zawick, 1706 Main St., Hellertown, Pa. 18055

Filed Nov. 8, 1973, Ser. No. 413,792
Int. Cl.² D05B *3/12*
U.S. Cl. 112—265 **3 Claims**

1. A sewing machine comprising: means for temporarily storing a strip of material, a sewing mechanism, and means for feeding a strip of material from the storing means to the sewing mechanism with a reduced time-variation in the tension of

the strip at a location immediately preceding the sewing mechanism, the feeding means comprising a roller located in the path of feed of the strip of material from the storing means to the sewing mechanism and adapted to have the strip wound about it, and means for rotating said roller, at least during the operation of the sewing mechanism, at a peripheral speed

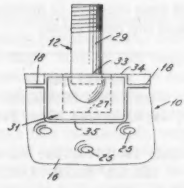


greater than the demand of the sewing mechanism, the surface of said roller being provided with at least one circular groove coaxial with the axis of rotation of the roller, and stationary separating means extending into said groove, for preventing a part of the winding of said strip about said roller on one side of the separating means from interfering with a part of the winding on the other side of the separating means.

3,911,843
METHOD OF MAKING A PLATE-TYPE HEAT EXCHANGE UNIT

Sheldon J. Stowell, Dimondale, Mich., assignor to Tranter Manufacturing, Inc., Lansing, Mich.

Division of Ser. No. 297,892, Oct. 16, 1972, Pat. No. 3,822,742. This application Apr. 24, 1974, Ser. No. 463,682
Int. Cl.² B21D *53/02*; B23P *15/26*
U.S. Cl. 113—118 D **2 Claims**

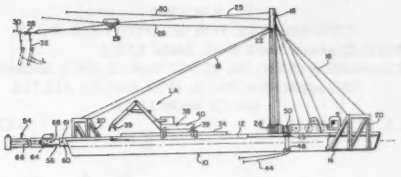


1. A method of making a plate-type heat exchange unit, comprising assembling a pair of similar flat plate components in flat-wise, face-to-face contact with one another, with said components formed to afford marginal notching extending therein from an edge and in the plane thereof, marginally and intermediately securing said assembled components unitarily to one another by a welding pattern including successive spot-like welds, preparing at least one rigid fluid flow fitting unit including a cylindrical fitting and a pair of like stamped plate members shaped and rigidly secured to said fitting in circumferentially surrounding relation to a portion of the latter, with the remainder of said plate members being in the main in fixed flat-wise spacing relative to one another to straddle said marginal component notching, thus straddling the fitting unit and rigidly securing said remainder thereof to sides of the assembled plate components, and using said cylindrical fitting and plate members in internally expanding the interior of the unitarily welded component assembled under external fluid pressure applied at said marginal notching and between said plate components, thus to afford spaces of pillow-like sectional contour between the plate components, adjacent ones of such spaces being in direct open communication, longitudinally and laterally, with one another.

3,911,844
LOG YARDING BARGE

Kenneth C. Foreman, P.O. Box 271, Ketchikan, Alaska

Continuation of Ser. No. 339,742, March 12, 1973, abandoned, which is a division of Ser. No. 198,170, Nov. 12, 1971, Pat. No. 3,734,045. This application Feb. 28, 1974, Ser. No. 446,913
Int. Cl.² E02F *9/00*
U.S. Cl. 114—.5 R **7 Claims**

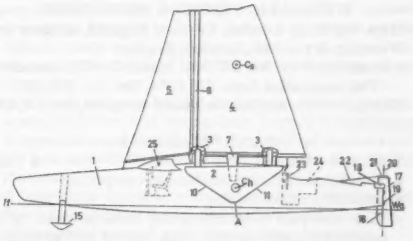


1. In a floatable logging barge for use adjacent the shore and having forward and rear ends and a working deck, a tower upstanding on the barge, means anchoring the barge to the shore, and means coupled to the tower for delivering logs to the barge, the improvement comprising a removable stiff leg connected to the barge for abutting the shore to hold the barge off the shore against the force of the log delivering means pulling the barge toward the shore, coupling means releasably coupling the stiff leg to the barge at a location below the working deck so as to be removed from the path of incoming logs, said coupling means including a pivotal bracket arm swingable upwardly above the working deck, guide means for slidably guiding the stiff leg along the bracket arm when the bracket arm is raised to permit the stiff leg to be pulled onto the deck, and means for horizontally extending said stiff leg shoreward away from said barge.

3,911,845
SAILING HYDROFOIL CRAFT

Gerald Herbert Holtom, 5 Hillside St., Hythe, England

Filed May 17, 1972, Ser. No. 254,190
Claims priority, application United Kingdom, May 17, 1971, 15228/71
Int. Cl. B63b *39/06*
U.S. Cl. 114—39 **8 Claims**



1. A sailing craft comprising: a monohull with accommodation for a helmsman, outrigger means extending in an athwartship's direction either side of the monohull, at least one port and starboard hydrofoil having a negative buoyancy characteristic mounted rigidly on the outboard end of the outrigger means, "the leading edge of the port and starboard hydrofoils being shaped so as to be parallel with the fore and aft line of the craft," the entire lower surface of at least the trailing portion of each hydrofoil being disposed at an angle outwardly turned with respect to a fore and aft line, divergent in plan and downwardly convergent in an athwartships vertical plane to exert a righting moment on the craft when submerged during

forward movement having a horizontal component acting in opposition to the horizontal component of the force of the wind on the said, "said hydrofoils being slightly dished between said leading edge said trailing portion," and said hydrofoils being mounted to position the lowermost extremities of both said hydrofoils substantially no lower than the designed water level, whereby the heel of the craft when sailing raises the windward hydrofoil above the water and at least partially submerges the leeward hydrofoil.

3,911,846

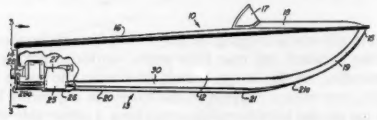
STEPPED HULL FOR JET-POWERED BOAT

Wayne England, North Fork, Idaho 83466

Continuation of Ser. No. 68,941, Sept. 2, 1970, abandoned. This application Dec. 6, 1972, Ser. No. 312,712

Int. Cl. B63h *11/08*

U.S. Cl. 114—66.5 R **6 Claims**



1. A shallow draft, boat hull constructed for water-jet propulsion and having wall means which together define a broad and open interior for carrying passengers and cargo on shallow rivers, said wall means defining a bow for the boat; a transom; mutually opposing, longitudinal side walls interconnecting the bow and transom; a boat bottom connected to the bow, transom, and side walls; an elongate step having substantially vertical sides and V-shaped bottom and extending longitudinally of said bottom of the hull centrally thereof and forwardly from the transom at least about two-thirds the length of the hull, the width of said step being approximately one-quarter the width of said bottom and the entire assembly being of shallow draft, the said bottom extending in slightly upwardly sloping, unstepped formation from the sides of said step to the said longitudinal side walls; a water-intake aperture in said step adjacent to the transom for receiving the water-intake means of a water-jet propulsion unit; and an outlet aperture in the transom above the step for receiving the water-jet propulsion unit.

3,911,847

HYDRAULIC STEERING MECHANISM

Nicolas Worthing, London, London, England, assignor to N. Worthing & Co. Ltd., London, England

Continuation of Ser. No. 337,766, March 2, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,617

Claims priority, application United Kingdom, Mar. 4, 1972, 10235/72

Int. Cl.² B63H *25/22*

U.S. Cl. 114—150 **6 Claims**

1. A hydraulic steering mechanism comprising:

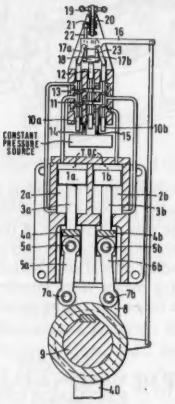
a constant pressure source;

at least one pair of double acting rams powered by said constant pressure source, each ram of said at least one pair of double acting rams having a piston and a cylinder; a control surface;

an arm having a pair of crankpins thereon, one crankpin of said pair of crankpins being coupled to one ram of said at least one pair of double acting rams and the other crankpin of said pair of crankpins being coupled to the other ram of said at least one pair of double acting rams;

means to fixedly attach said arm to said control surface, said arm and said crankpins being so arranged that said piston of said one ram of said at least one pair of double acting rams passes through top dead center when said control surface is partially deflected in one direction from the mid position of said control surface and said piston of said other ram of said at least one pair of double acting rams passes through top dead center when said control surface is partially deflected from said mid position of said control surface in a direction opposite said one direction;

at least one pair of reversing valves, one of said at least one pair of reversing valves having fluid connections to each end of said one ram of said at least one pair of double acting rams and the other of said at least one pair of reversing valves having fluid connections to each end of



said other ram of said at least one pair of double acting rams;

means to couple said at least one pair of reversing valves to said constant pressure source, each of said reversing valves of said at least one pair of reversing valves reversing said fluid connections to its associated ram of said at least one pair of double acting rams as said piston of each ram of said at least one pair of double acting rams passes through its said top dead center.

3,911,848

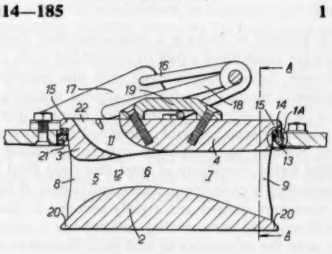
BAILING DEVICES

Peter H. Brazier, 49 Richmond Way, Fetcham, Surrey, England

Filed July 19, 1974, Ser. No. 490,123

Int. Cl.² B63B *13/00*

U.S. Cl. 114—185 **1 Claim**



1. In a bailing device for a vessel,

a duct assembly defining a duct having a convergent inlet section, a divergent outlet section, and an intermediate low pressure zone, said duct assembly being located within an aperture in the underside of the hull of the vessel,

a mounting assembly mounting the duct assembly for movement between an operative position in which the duct is located outwardly of the hull with the axis of the duct lying fore and aft of the hull and an inoperative position

in which the duct is retracted within the hull, said mounting assembly comprising

mounting means secured in the interior of the hull, and

manually operable pivotal lever means linked to the mounting means and the duct assembly, said lever means being located in the interior of the hull and being pivotal from a first stop position in which the duct assembly is in its operative position and a second stop position in which the duct assembly is in its inoperative position, movement of the lever means between its stop positions serving to move the duct assembly between its operative and inoperative positions rectilinearly in a direction transverse to the axis of the duct assembly, and

passage means defined within the duct assembly and extending between the low pressure zone and the interior of the hull.

3,911,849

APPARATUS FOR EXTERNAL TREATMENT OF SHIPS' HULLS OR THE LIKE

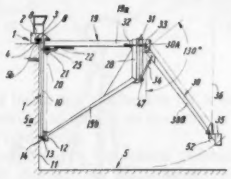
Paul Hammelmann, Zum Sundern 17, Oelde, Westphalia, Germany

Filed Jan. 28, 1974, Ser. No. 438,488

Claims priority, application Germany, Feb. 1, 1973, 2304751

Int. Cl.[2] B24C *3/06*; B63B *59/00*

U.S. Cl. 114—222 **19 Claims**



1. Apparatus for treating vertical and/or inclined surfaces, particularly for cleaning, painting and/or similar treatment of external surfaces of ships' hulls in dry docks, comprising a carriage; ways supporting said carriage for movement along a substantially horizontal path and lengthwise of a surface to be treated; a beam supported by said carriage and pivotable with respect thereto about a first substantially vertical axis; motor means connected to said beam for pivoting the same relative to said carriage along an arc of about 180°; an elongated boom supported by and pivotable with respect to said beam about a horizontal axis and a second vertical axis, said boom having an end remote from said last mentioned axis; and at least one surface treating device provided at said end of said boom.

3,911,850

DEVICE FOR DISPLACING THE ENGAGEMENT POINT OF A HAWSER

Wolfgang Baer; Ulrich Sturmhofel, both of Heidenheim (Brenz), and Karl Blickle, Bolheim, all of Germany, assignors to J. M. Voith, GmbH, Heidenheim (Brenz), Germany

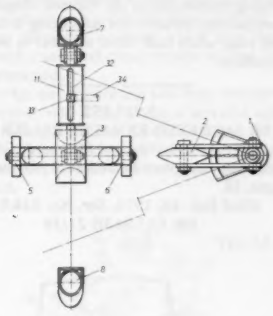
Filed June 6, 1974, Ser. No. 476,947

Claims priority, application Germany, June 9, 1973, 2329633

Int. Cl.[2] B63B *21/56*

U.S. Cl. 114—235 A **6 Claims**

1. A device for displacing the point of engagement of a hawser on a ship wherein the hawser extends from the stern of a towing ship comprising means defining a point on substantially the rear quarter of the length of the ship at which a hawser pivotally extends therefrom, means sternwardly from said pivot point between the stern and said pivot point for defining a pivot axis in the vertical plane of the longitudinal axis of the ship, a rocker arm pivotally mounted on said pivot axis and having a hawser opening on the end thereof, and abutment means on both sides of said longitudinal axis vertical



plane sternwardly of said pivot point and engageable by said rocker arm to limit the range of pivoting thereof.

3,911,851

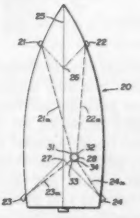
BOAT STEERING PROPULSION SYSTEM

H. Donald Canazzi, 178 Jewett Parkway, Buffalo, N.Y. 14214

Filed May 8, 1974, Ser. No. 468,151

Int. Cl. B63h *11/04*

U.S. Cl. 115—12 R **18 Claims**



11. On a boat having a steering propulsion system which includes:

a pair of front thrusters located on opposite sides of the boat toward the bow and having their respective thrust axes at opposite acute angles to the longitudinal centerline of the boat and offset forward from the center of gravity of the boat;

a pair of rear thrusters located on opposite sides of the boat toward the stern and having their respective thrust axes at opposite acute angles to the longitudinal centerline of the boat and offset rearward from the center of gravity of the boat;

and selectively operable valve means for controlling the flow of pressurized fluid individually to said thrusters;

the improvement wherein said valve means comprises:

a stator having four circumferentially spaced outlet ports, each connected individually to a corresponding thruster; and a rotatively adjustable valve member having three passages for registration selectively at their outer ends with said stator ports in different rotative positions to which said valve member is indexed;

a first one of said three passages in the valve member having a width at its outer end such that it registers with a first one of said stator ports in more than one of a series of successive neighboring positions to which said valve member is rotatively indexed whereby to operate the thruster connected to said first stator port in each of said successive positions of the valve member;

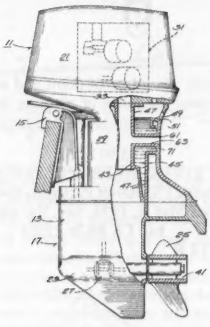
and a second one of said passages in the valve member registering with a second stator port in only one of said series of positions of the valve member, said second stator port being connected to the thruster diagonal from said first-mentioned thruster for producing a turning couple on the boat when said valve member is indexed to said one position.

3,911,852

WATER JACKETED EXHAUST RELIEF SYSTEM

George E. Miller, Libertyville, and Michael J. Griffith, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 20, 1974, Ser. No. 444,050
Int. Cl.[2] B63H *21/34*
U.S. Cl. 115—17 **6 Claims**



1. A marine propulsion device comprising a propulsion unit including a lower unit rotatably supporting a propeller and intended to be at least partially submerged in water, an internal combustion engine including an exhaust gas outlet, an exhaust gas discharge outlet located in said lower unit and intended to be submerged in water when said engine is operating at low speed, an exhaust gas duct extending from said engine exhaust gas outlet to said discharge outlet, an exhaust relief outlet communicating with the atmosphere, an exhaust relief conduit extending from said exhaust gas duct to said exhaust relief outlet, and a water jacket extending around said exhaust relief conduit from said exhaust gas duct to said exhaust relief outlet.

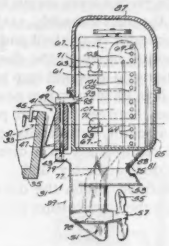
3,911,853

LOW PROFILE OUTBOARD WITH IN-LINE ENGINE

Charles D. Strang, Lake Forest, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 330,596, Feb. 8, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 459,910
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—18 R **9 Claims**

1. An outboard motor comprising a propulsion unit, means connected to said propulsion unit and adapted to be attached to the transom of a boat for affording vertical swinging movement of said propulsion unit relative to the transom about a horizontal tilt axis and for affording steering movement of said propulsion unit relative to the transom about a steering axis extending transversely of said tilt axis, said propulsion unit comprising a lower unit including an exhaust gas discharge outlet normally located underwater, a powerhead assembly rigidly fixed to the top of said lower unit and including an engine with a plurality of vertically in-line cylinders each including an exhaust port, and an exhaust gas discharge system including an inverted "U" shaped passageway comprising an upper junction portion located above the at-rest water level when the outboard motor is boat mounted, a first leg extending downwardly from said junction portion and communicating with at least one of said exhaust ports, and a second leg extending downwardly from said junction portion and separately from said first leg and communicating with said lower unit underwater exhaust gas discharge outlet.

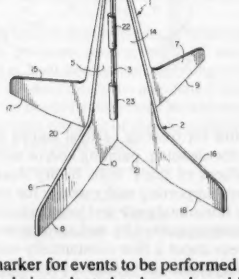


3,911,854

COURSE MARKER FOR CYCLISTS

James Edward Manuel, P.O. Box 627, Port Jefferson, N.Y. 11777

Filed Mar. 22, 1974, Ser. No. 453,803
Int. Cl.[2] A63B *67/00*; E01F *09/00*
U.S. Cl. 116—63 P **2 Claims**



1. In a course marker for events to be performed by cyclists, the course marker being adapted to be packaged in knocked down form and easily assembled and installed on a surface over which the event is to be performed, the combination of two unitary flat support members each comprising an intermediate portion and two end portions integral with said intermediate portion, each end portion of each support member having a ground-engaging edge and the ground-engaging edges of the end portion of each support member being mutually coplanar,

said intermediate portion of one of said support members having a straight slot which is of a width to slidably receive the intermediate portion of the other of said support members, said slot opening away from the ground-engaging edges of said one support member and extending at right angles to the common plane of said ground-engaging edges of said one support member,

said intermediate portion of the other of said support members having a straight slot which is of a width to slidably receive the intermediate portion of said one support member, said last-mentioned slot opening toward the ground-engaging edges of said other support member and extending at right angles to the common plane of said ground-engaging edges of said other support member,

whereby said support members can be interfitted in crossed relation with the slot of each of said support members slidably embracing the other of said support members

along a line at right to said ground-engaging edges, said slots being of such length that, when the two support members are thus interfitted, the ground-engaging edges of both support members can lie in a common plane;

a standard having a lower end and an upper end,

said lower end of said standard being releasably attachable to the intermediate portion of at least one of said two support members in such fashion that when said support members are interfitted and disposed with said ground-engaging edges on the surface over which the event is to be performed, said standard extends upwardly generally at the intersection of said two support members; and

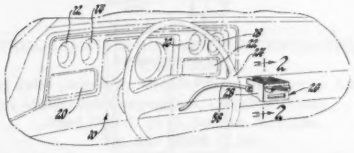
a horizontally disposed ring carried by the upper end of said standard for supporting an object to be lifted therefrom by a cyclist during performance of the event.

3,911,855

SERVICE CARD DISPENSER

Harold Arthur Haven, Hale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1974, Ser. No. 512,476
Int. Cl.² G01D *13/00*
U.S. Cl. 116—114 W **4 Claims**



1. A service indicating mechanism for a vehicle responsive to mileage intervals to inform an operator of periodic service requirements comprising:

a housing supported by the vehicle dashboard and having a front face visible from the vehicle passenger compartment;

mileage counting means including first and second portions which move after corresponding first and second mileage intervals;

said housing forming a recess above said mileage counting means and said movable portions;

at least one service indicator card supported in said recess;

track-forming means including said recess and a slot in the front face of said housing for directing movement of said service card out from said recess, through said slot and away from said face of said housing to expose a portion of said card to the vehicle passenger compartment;

means on said service card coactive with said first and second movable portions of said mileage counting means to initially move the service card toward said slot at a first predetermined rate proportional to said first mileage interval and subsequently to move said service card through said slot into said vehicle passenger compartment at an accelerated second rate proportional to said second and smaller mileage interval.

3,911,856

MEDICATION DISPENSER AND SCHEDULE REMINDER

Charles C. Ewing, 715 Broadway, Wellsville, Ohio 43968

Filed Aug. 28, 1974, Ser. No. 501,056
Int. Cl.² G09F *9/40*
U.S. Cl. 116—121 **7 Claims**

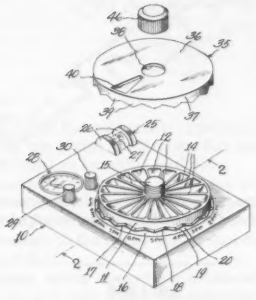
1. A medication dispenser and schedule reminder comprising

a base having a circular wall extending upwardly therefrom, said wall defining the bottom boundary of a plurality of compartments formed by a plurality of spaced ribs radiating from a center upstanding hub on said base, each compartment opening upwardly and adapted to contain an object such as a medicinal tablet or medicine reminder to be taken at a predetermined time,

a cover of a size to overlie all of said compartments and having a central opening to pass said hub therethrough whereby said cover is rotatable about said hub, said cover having an offcenter opening which may be rotatably aligned with a selected compartment so that the contents may be removed,

a circular ledge circumscribing said base circular wall at its lower portion, said ledge having a serrated upper edge,

said cover having a circular flange bounding said base wall and having a serrated lower edge interfitting with and complementary to said serrated upper edge of said base ledge, and,



a retainer cap having means threadedly cooperable with said hub whereby said cap overlies said cover and releasably securable to said hub to hold said cover in position closing said compartments excepting the compartment exposed by said cover opening,

the complementary base ledge and cover flange serrations mating and seating when said cap is secured to said hub thereby to restrict rotation of said cover,

thereby to ensure that only the selected exposed medication is taken at the predetermined time and whereby loosening of said retainer cap releases the engaging serrations and permits turning of said cover to expose a further compartment containing medicament for another predetermined time.

3,911,857

COURSE OBSTACLE AND WHEEL ACTUATED SIGNAL FOR CYCLISTS

James Edward Manuel, P.O. Box 627, Port Jefferson, N.Y. 11777

Filed Mar. 22, 1974, Ser. No. 453,804
Int. Cl.² G09F *19/00*; **A63K** *03/00*
U.S. Cl. 116—132 R **15 Claims**

1. In a combined course obstacle and signal device for events performed with bicycles and the like, the combination of

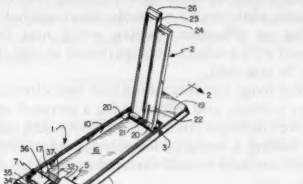
a base adapted to rest upon the surface over which the event is to be performed;

signal means carried by said base and including actuating means for actuating the signal means from a stored, inactive condition to an observable signalling condition; and operating means for said signal means comprising

a plurality of wheel actuated treadle means carried by said base, each of said treadle means being so spaced from each other and so disposed beside said base as to be observable by a cyclist as defining a particular manipulation of the cycle required for actuation of the signal means,

said treadle means connected to means operationally coacting with said actuating means, said connected

means constructed and arranged to operate said actuating means of the signal means in response to operation



of said treadle means as a result of successful performance of the required particular manipulation of the cycle.

3,911,858

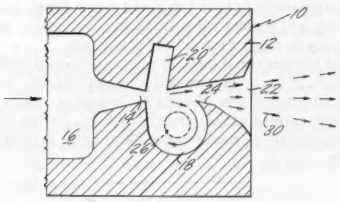
VORTEX ACOUSTIC OSCILLATOR

R. Wendell Goodwin, Westport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1974, Ser. No. 475,090

Int. Cl.² F15C *1/16*; B06B *3/00*; G10K *10/00*

U.S. Cl. 116—137 A **2 Claims**



1. A vortex acoustic oscillator comprising:

a liquid inlet adapted to receive a flow of liquid;

a liquid outlet;

a substantially straight liquid flow path from said inlet to said outlet;

a curvilinear vortex chamber for receiving at least a portion of the flow of liquid from said inlet and for causing the flow of said liquid to be in the form of a vortex characterized by a cavitation region, said vortex chamber being contiguous with and disposed on a first side of said path and having a substantial portion along said path open to said path;

an edge disposed in said flow path between said inlet and said outlet for diverting to said vortex chamber a portion of the liquid flowing from said inlet; and

a closed end resonant chamber disposed substantially perpendicular to said liquid flow path on a side of said path opposite to the portion of said vortex chamber open to said path, said closed end resonance chamber disposed to respond to liquid flow around said vortex chamber to create pressure waves at a frequency related to the dimensions of said chamber, said pressure waves periodically collapsing said cavitation region thereby causing the liquid to break up into drops and emitting periodic acoustical waves as it exits out.

3,911,859

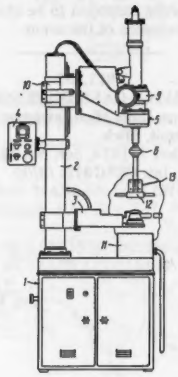
APPARATUS FOR BUILDING UP WITH DEPOSITED METAL THE SEATING SURFACES OF VALVES

Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Boleslav Ivanovich Maximovich, Bulvar Lesi Ukrainki, 2, kv. 52; Konstantin Petrovich Bykovets, Prospekt 40 letia Oktyabrya, 112, kv. 52, and Vitaly Voitsekhovich Zavodyan, Bulvar Ivana Lepse, 55, kv. 20, all of Kiev, U.S.S.R.

Continuation of Ser. No. 808,928, March 20, 1969, abandoned. This application Mar. 1, 1971, Ser. No. 119,934

Int. Cl. B05c *9/14*

U.S. Cl. 118—1 **9 Claims**



1. An apparatus for building up the seating sur aces of valves with deposited metal comprising an inductor for heating a valve, cooling means for decreasing the temperature with in said valve and causing directed solidification of said deposite metal, an electromagnetic chuck means for fixedly securing said valve in a position relative to said inductor for permitting the deposition of metal on the seating surface of said valve by inductive heating of said valve, and means actuating said electromagnetic chuck means upon introduction of the valve therein.

3,911,860

DEVICE FOR THE CONTINUOUS PRODUCTION OF DRAGEES

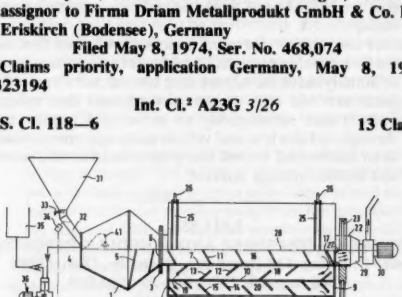
Odon Nohynek, Autenweiler Kreis Oberlingen, Germany, assignor to Firma Driam Metallprodukt GmbH & Co. KG, Eriskirch (Bodensee), Germany

Filed May 8, 1974, Ser. No. 468,074

Claims priority, application Germany, May 8, 1973, 2323194

Int. Cl.² A23G *3/26*

U.S. Cl. 118—6 **13 Claims**



1. A device for the continuous production of dragees through the coating and glossing of dragee cores, the device comprising in combination:

a dragee coating drum arranged for rotation around a substantially horizontal axis and having a feed opening at one axial end and a discharge opening at its other end;

an after-treatment drum likewise arranged for rotation around a substantially horizontal axis and having an inlet opening for the reception of coated dragees from the coating drum and a discharge opening for the discharge of treated dragees;

means for continuously conveying the dragees axially from the feed opening of the coating drum through the latter and into and through the after-treatment drum;

means for continuously driving both drums;

means for feeding dragee cores to the coating drum at a controllable rate;

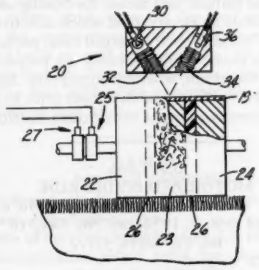
means for feeding coating material to the coating drum at a controllable rate; and

means for applying a glossable protective outer skin to the coated dragees during their passage through the after-treatment drum, said skin applying means including a layer of solvent-diluted wax on an inner wall of the after-treatment drum which is being contacted by advancing coated dragees, and means for solidifying said wax on the coated dragees, following such contact application.

3,911,861
PROGRAMMABLE TONER CONCENTRATION CONTROL

Jerome John Griesmer, Mentor, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,226
Int. Cl.² B05C *11/00*
U.S. Cl. 118—7 **22 Claims**



1. For use with an electrophotographic reproduction apparatus having a developer unit for depositing toner onto a latent image pattern from a developer mix containing toner particles and carrier particles, a system for sensing the effective concentration of toner in the mix, said system comprising:

toner pickup means for attracting the toner paticles from the developer mix handled by the developer unit and including a rotatably mounted pickup member separate from the latent image pattern and divided into at least first and second surface areas substantially insulated from each other,

means for rotating said pickup member,

program circuit means for applying a first electrical potential to said first area and a second electrical potential different than said first electrical potential to said second area, said first electric potential being of a polarity to attract the toner particles to said first area and corresponding to the imaged areas of the image pattern to be developed, said second electric potential corresponding to the background areas of the image pattern to be developed,

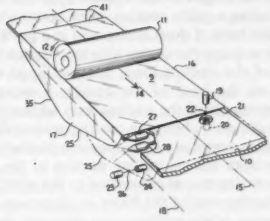
a source of light, and

means for sensing the light reflected from said first area to provide a signal representative of the light intensity.

3,911,862
ENVELOPE FLAP MOISTENING APPARATUS

Raymond R. Lupkas, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 4, 1974, Ser. No. 520,245
Int. Cl.² B05C *11/00*
U.S. Cl. 118—7 **9 Claims**



1. An envelope flap moistening apparatus, comprising:

a reservoir containing an envelope flap moistening fluid;

means defining an envelope feed path;

a fluid nozzle for discharging moistening fluid received from said reservoir, said nozzle being disposed adjacent said envelope flap feed path so that an envelope flap passing in proximity to the nozzle will be moistened by said discharged fluid;

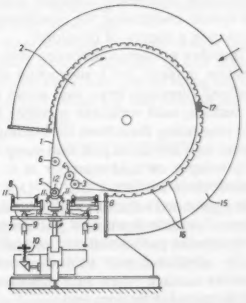
fluid supply means operatively connected between said reservoir and said nozzle for supplying the moistening fluid from the reservoir to the nozzle; and

sensing means disposed adjacent said feed path for sensing an edge of an envelope moving past said sensing means, said sensing means operatively connected to said fluid supply means for actuating said fluid means to supply the nozzle with moistening fluid from the reservoir in response to the sensing of said envelope edge.

3,911,863
TEST INSTALLATION FOR SINGLE LAYER OR MULTIPLE LAYER COATING AND DRYING OF SHEETS OF PAPER OR FILM

Peter Herzhoff, Leverkusen; Hans Gref, Cologne; Herbert Bruck, Leverkusen, and Josef Busch, Bensberg-Refrath, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

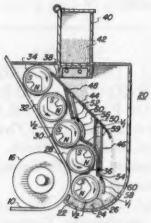
Filed Sept. 18, 1973, Ser. No. 398,333
Claims priority, application Germany, Sept. 23, 1972, 2246798
Int. Cl.² B05C *11/00*, *3/12*
U.S. Cl. 118—68 **8 Claims**



1. A test installation for single-layer or multilayer coating of sheets of paper or film with viscous liquids, following by dry-

ing with air, comprising means for guiding the sheet in the form of an endless loop along a path, a coater for coating the sheet with a viscous liquid operatively arranged at a station upon the endless loop, an air-jet dryer downstream thereof for drying the coated sheet arranged along the path, a means for preparing the air fed to the air-jet dryer in which the variables of the drying air are adjustable without any appreciable time-lag whereby drying conditions along a long path which is a multiple of the length of the endless loop are simulated, the coater including a guide coating roller about which a portion of the endless loop of sheet is disposed in a protruding portion of the endless loop, the coater also including a base disposed externally of the endless loop, coating liquid supply means connected to the base of the coater, a movable platform mounted externally of the endless loop adjacent the protruding portion disposed about the coating guide roller, a plurality of coater bases mounted on the movable platform for selective engagement with the protruding portion of the endless loop, transverse moving means connected to the platform for selectively positioning one of the bases in alignment with the protruding portion of the endless loop disposed about the guide coating roller, and longitudinal translating means connected to the platform for moving it and the coater bases disposed upon it toward and away from the protruding portion of the endless loop whereby one of the coater bases is operatively engageable with the protruding portion of the endless loop to apply liquid to it and is movable away from it.

3,911,864
TONER PRELOADED MAGNETIC BRUSH DEVELOPMENT SYSTEM
Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 17, 1973, Ser. No. 324,467
Int. Cl.² G03G *15/09*
U.S. Cl. 118—637 **11 Claims**



1. A magnetic brush development system for an electrostatic processor to develop latent electrostatic images carried by a movable photosensitive surface through the use of a developer containing oppositely charged toner and carrier particles; said system comprising the combination of

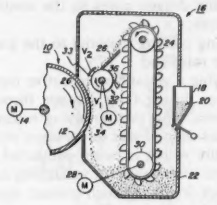
a sump for storing a supply of developer;

a rotatable member positioned between said sump and said photosensitive surface for transporting developer in a predetermined direction from said sump to said photosensitive surface, said rotatable member having a magnetic field emanating therefrom for loading developer on said member as it advances past said sump and for retaining said developer on said member as it advances past said photosensitive surface;

an electrode positioned adjacent said rotatable member on a side thereof remote from said photosensitive surface, whereby successive portions of said rotatable member are sequentially advanced past said electrode, sump and photosensitive surface when said member is rotated in said predetermined direction; and

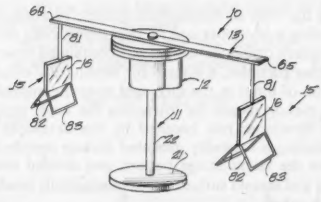
means coupled to said electrode and said rotatable member for establishing a potential difference therebetween of a polarity tending to cause toner particles to adhere to said rotatable member prior to the loading thereof with developer.

3,911,865
TONER PICKOFF APPARATUS
Stewart William Volkers, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 30, 1973, Ser. No. 346,485
Int. Cl.² G03G *13/00*
U.S. Cl. 118—637 **12 Claims**



1. In an electrostatic processor having a photosensitive surface for carrying an electrostatic latent image, and a development system including means for transporting developer along a predetermined path leading toward and away from said surface to develop said image; said developer containing properly and improperly charged toner particles, with the properly charged particles being triboelectrically attracted to carrier particles; the improvement comprising the combination of electrically conductive means adjacent said path and upstream of said surface, and means for biasing said conductive means to create an electric field which selectively attracts at least some of the improperly charged toner particles toward said conductive means while repelling the properly charged toner particles therefrom, whereby improperly charged toner particles are removed from said developer prior to developing said image to thereby suppress background development.

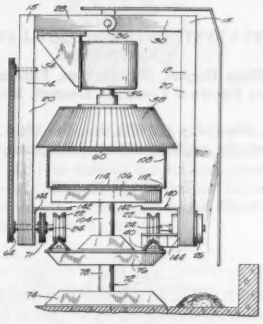
3,911,866
MOTORIZED BIRDIE RIDE
Louie R. Dodd, 1553 Irving Ave., St. Louis, Mo. 63133
Filed Sept. 3, 1974, Ser. No. 502,910
Int. Cl.² A01K *31/12*
U.S. Cl. 119—26 **4 Claims**



1. A merry-go-round ride for birds, said ride comprising an electric motor, a motor driven shaft extending vertically, an elongated rigid member centrally connected to said shaft and driven thereby to rotate about a vertical axis, the rigid member supporting at opposite ends perches for birds to alight upon and means responsive to the weight of a bird upon perch to activate an elctrical circuit to energize the motor, said last named means deactivating said circuit upon the release of the bird from said perch the electrical circuit activating means comprising a pair of vertically spaced upper and lower flat plates centrally connected to the motor shaft, said upper plate being connected to the elongated rigid member and adapted to be tilted toward the other plate by the weight of a bird

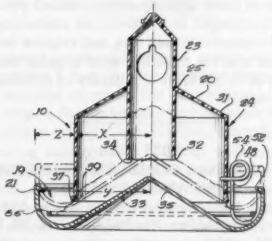
alighting on a perch, spring means biasing the plates apart from one another, and normally open electrical contacts in aligned registry with one another adapted to contact one another when the weight of a bird upon the perch causes the plate connected to the elongated rigid member to the tilted.

3,911,867
LIVESTOCK FEEDER
Vernon R. Berg, Jr., 413 W. Park St., Marshfield, Wis. 54449
Filed Dec. 26, 1974, Ser. No. 536,674
Int. Cl.² A01K *5/02*
U.S. Cl. 119—52 B **6 Claims**



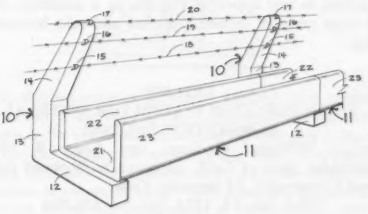
5. In a livestock feeder including a brush assembly and a track for supporting the brush assembly for movement along a conveyor carrying feed and wherein said brush assembly includes a rotary brush sweeping the feed laterally from the conveyor, the improvement comprising legs on said brush assembly, wheels on said legs supported on said tracks and track guards located over said wheels connected to said legs, and movable with said brush assembly for preventing feed accumulation on said tracks.

3,911,868
POULTRY FEEDER
Howard S. Brembeck, Goshen, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.
Continuation of Ser. No. 378,652, July 12, 1973, abandoned. This application July 2, 1974, Ser. No. 485,096
Int. Cl.² A01K *5/00*
U.S. Cl. 119—53 **11 Claims**



7. A feeder for poultry and the like adapted for use with a feed conveyor, the feeder including hood means and pan means suspended from the hood means, the pan means having a conical bottom portion and an upstanding side portion, and the hood means comprising a storage pipe member adapted to depend from the feed conveyor to receive feed therefrom and to store a limited quantity thereof above the pan means, the pipe member terminating at an edge spaced above the pan means to form with the pan conical bottom portion a first gate through which a limited amount of feed can pass, the hood means further comprising a shell member rigidly connected to the storage pipe member, extending outwardly and downwardly from the storage pipe member, and terminating at an edge spaced apart from the storage pipe member and the pan means to form with the pan conical bottom portion a second gate through which a limited amount of feed can pass, the pipe member terminal edge being fixed in relation to the hood terminal edge and being disposed in relatively close proximity to the apex of the pan conical portion, and the shell member terminal edge being in similar relatively close proximity to the lower area of the pan conical bottom portion and with peripheral radial equidistant spacing from the pipe terminal edge, whereby to provide well-defined and peripherally uniform restricted first and second gate opening areas through which limited amounts of feed can pass and permitting the storage of limited amounts of feed in the feeder, the shell member including a wall spaced apart from and positioned more proximate with respect to the pan side portion than to the apex of the pan conical portion to form a feeding area having an interior of extended periphery and only sufficient width to permit the poultry to obtain feed from the feeder but to prevent feeding poultry from climbing bodily into the feeder.

3,911,869
FEED BUNK SUPPORT
Charles R. Lien, 511 W. 1st St., Holdrege, Nebr. 68949
Filed Jan. 17, 1974, Ser. No. 434,348
Int. Cl.² A01K *5/01*
U.S. Cl. 119—61 **6 Claims**

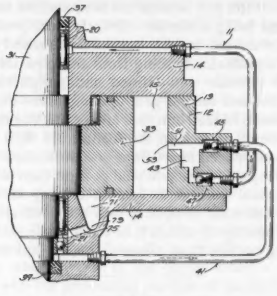


1. A feed bunk support comprising:
a substantially horizontal leg having a bottom surface which engages the ground and an upper surface supporting a feed bunk above the ground;
a substantially vertical leg connected at one end to one end of said horizontal leg;
a canted leg secured on one end to the other end of said vertical leg with the other end thereof angled toward the feed bunk and positioned over said horizontal leg and above the feed bunk; and
connecting means secured to said canted leg for receiving a fence which extends laterally of said horizontal leg and above the feed bunk, said means being disposed vertically above said horizontal leg and intermediate the ends of said horizontal leg.

3,911,870
UPPER CRANKSHAFT BEARING LUBRICATION
Eugene R. Hackbarth, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 22, 1974, Ser. No. 444,846
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.01 **4 Claims**

1. An engine having upper and lower crankshaft bearings, means defining a chamber subject to cyclical pressure variation in response to engine operation, a sump for accumulating "drains" from the engine, a conduit communicating between

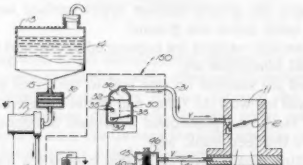
said upper bearing and said sump including an intermediate portion, a first one-way valve means located between said upper bearing and said intermediate conduit portion for permitting flow from said intermediate conduit portion to said upper bearing and for preventing flow from said upper bearing to said intermediate conduit portion, a second one-way valve means located between said intermediate conduit portion and said sump for permitting flow from said sump to said intermediate conduit portion and for preventing flow from said intermediate conduit portion to said sump, and duct means communicating between said chamber and said intermediate conduit portion between said one-way valve means for cyclically pressurizing said intermediate conduit portion so as to pump liquid from said sump to said intermediate portion during a condition of relatively low pressure in said chamber and said intermediate portion and to pump liquid from said intermediate portion to said upper bearing during a condition of relatively high pressure in said chamber and said intermediate portion.



3,911,871
FLUID INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Elmer A. Williams, Gardena, and Roger B. Walker, Northridge, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1974, Ser. No. 435,804
Int. Cl.² F02D *19/00*
U.S. Cl. 123—25 K **22 Claims**



1. In a vehicle having an internal combustion engine with an intake system, a throttle control, and a transmission with gearing, apparatus for selectively adding cooling fluid into the intake system comprising:

a fluid container;

a filter for filtering fluid passing from said container;

regulating means regulating addition of the fluid from said container to the intake system, said regulating means having a normally closed control valve allowing fluid flow to the intake system when open and preventing fluid flow to the intake system when closed; wherein said regulating means also includes a second valve, said second valve allowing fluid from said container to flow to the intake system only at high intake manifold vacuum.

sensing means to sense vehicle operating conditions;

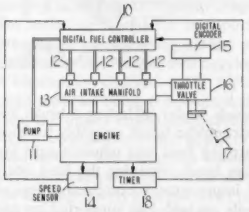
means responsive to said sensing means to selectively transmit an activating signal to open said control valve; and

dispersing means positioned in the intake system to disperse within the intake system the fluid from said container which has been allowed to be added to the intake system by said regulating means.

3,911,872
FUEL SUPPLY SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Ronald William Hughes, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 1, 1973, Ser. No. 356,128
Claims priority, application United Kingdom, May 13, 1972, 22781/72
Int. Cl.² F02D *5/02*
U.S. Cl. 123—32 EA **6 Claims**



1. A fuel supply system including a throttle valve for controlling the admissions of combustion air to an engine and having an angularly movable spindle, a digital encoder for said throttle valve for producing a digital output signal corresponding to the angular position of the spindle, and a digital electronic fuel control unit responsive to said output signal of the digital encoder for controlling the rate at which fuel is supplied to an engine in accordance with said output signal of the digital encoder, said encoder including an arm mounted for angular movement with the spindle, a plurality of contacts mounted on said arm, the number of said contacts corresponding to the number of bits of said digital output signal, and a plurality of fixed digitally coded contact paths equal in number to and arranged in a one-to-one contacting relationship with said contacts on said arm and relative to which the contacts on the arm are movable upon angular movement of the spindle so as to generate a plurality of different digitally coded output signals.

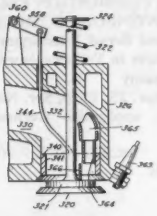
3,911,873
VARIABLE INTERNAL COMBUSTION ENGINE VALVE OPERATING SYSTEM

Sharad M. Dave, 14574 Braile, Detroit, Mich. 48223

Continuation-in-part of Ser. No. 302,004, Oct. 30, 1972, Pat. No. 3,762,381, which is a continuation-in-part of Ser. No. 59,638, July 30, 1970, abandoned. This application Sept. 20, 1973, Ser. No. 399,126The portion of the term of this patent subsequent to Oct. 2, 1990, has been disclaimed.
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 ST **11 Claims**

1. An improved internal combustion engine having a piston and a cylinder and a head delimiting a combustion chamber, a first inlet passage communicating with said combustion chamber, a valve seat at the juncture of said passage with said

combustion chamber and an inlet valve seatable on said valve seat, characterized by a sleeve valve mounted in said inlet passage, an annular shoulder on the passage side of said inlet valve, said shoulder having a minimum diameter sufficient to clear the inner periphery of said sleeve valve, actuatable



means to vary the position of said sleeve valve relative to said valve seat thereby varying the effective opening and the effective closing of said inlet valve, a second inlet passage communicating with said combustion chamber and formed to direct the fuel mixture in said second inlet passage into a particular portion of said combustion chamber.

3,911,874

INTERNAL COMBUSTION ENGINES

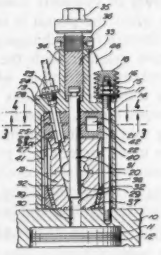
Philip Conrad Vincent, 7 Kew Bridge Court, London W4 3AE, England

Filed Aug. 15, 1973, Ser. No. 388,509

Claims priority, application United Kingdom, June 15, 1973, 28574/73; Feb. 8, 1973, 6200/73; July 23, 1973, 35094/73; Aug. 16, 1972, 38217/72

Int. Cl. F02b *3/00, 19/16*

U.S. Cl. 123—33 VC **14 Claims**



1. An internal combustion engine, comprising: a fuel combustion chamber, a fuel ignition chamber formed from a heat insulating material to retain the heat emitted by combusted fuel in the engine for preheating fuel injected therein, means to inject fuel into said ignition chamber, a combustion passage interconnecting said ignition chamber with said combustion chamber whereby air compressed in said combustion chamber is forced into said ignition chamber with preheated fuel and the resulting expansion of the burning air and fuel mixture forces said mixture through said combustion passage into said combustion chamber to complete combustion of said fuel with the air therein, wherein the improvement comprises forming the ignition chamber including said combustion passage from a synthetic ceramic material, at least one groove extending along said combustion passage, said at least one groove increasing in depth towards said ignition chamber end thereof, an obdurating valve member formed from a synthetic ceramic extending from said ignition chamber into said combustion passage to close the latter and leaving said groove open, and means to adjust said valve member along the axis of said combustion passage to vary the length of said groove covered by said valve member and thereby vary the flow restriction between said combustion chamber and said ignition chamber.

3,911,875

COOLED EXHAUST VALVE FOR AN INTERNAL COMBUSTION ENGINE

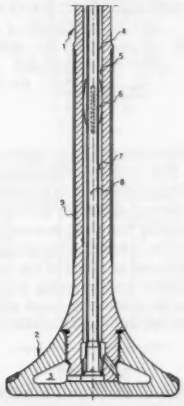
Bengt Ysberg, Paris, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Filed Jan. 17, 1974, Ser. No. 434,068

Claims priority, application France, Mar. 30, 1973, 73.11656

Int. Cl.² F01P *1/06*

U.S. Cl. 123—41.34 **1 Claim**



1. An internal combustion engine exhaust valve comprising a valve head, a valve rod having a cylindrical surface, internal channels in the valve rod and an internal chamber in the valve head for the circulation of a cooling fluid, said valve rod having a reduced external diameter on a portion of its cylindrical surface in proximity to the valve head and in particular in the region where the temperature of the external surface of the valve rod during operation corresponds substantially to the temperature of at least partial condensation or dew point of exhaust gases surrounding the valve rod, and a protecting coating withstanding chemical corrosion by at least a partially condensed portion of said exhaust gases and so disposed in said region as to form a smooth cylindrical surface without discontinuity with that portion of the valve rod connecting it to the valve head, said protecting coating being a metal alloy selected from the group consisting of a metal alloy comprising 0.08% carbon, 12% chromium, 15% molybdenum, 3% tungsten, 5% iron, 2.5% cobalt and 62.42% nickel, and of an alloy comprising 87% tungsten carbid and 13% cobalt.

3,911,876

AIR-COOLED SINGLE-CYLINDER INTERNAL COMBUSTION ENGINE

Fritz Freyn, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Feb. 22, 1974, Ser. No. 444,900

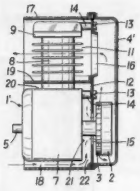
Claims priority, application Austria, Mar. 6, 1973, 1985/73

Int. Cl.² F01P *1/06*

U.S. Cl. 123—41.31 **4 Claims**

1. An air-cooled single-cylinder internal combustion engine comprising, a crankcase having a crankshaft, a cylinder head mounted on the crankcase, a flywheel attached to one extremity of the crankshaft, a cooling-air blower located at a front end of the flywheel facing the engine and rigidly connected with the latter, a cooling-air spiral surrounding the blower, a

mounting plate extending in transverse relation to the crankshaft axis between the engine and the blower and attached to the engine, said mounting plate having a first perforation through which the crankshaft extends and which defines a cooling-air gap in combination with the crankshaft, and a second perforation located in the area of the cylinder and the cylinder head of the engine, a sheet-metal shell attached to the side of the mounting plate facing the engine and encompassing the engine, a partition arranged within said sheet-metal sheel and subdividing the free space between the engine and the



sheet-metal shell into a lower and an upper portion, the lower portion defining a first cooling-air duct leading alongside the crankcase via the first perforation of the mounting plate to the suction end of the blower, the upper portion defining a second cooling-air duct leading from the second perforation of the mounting plate via the cylinder and cylinder head of the engine to the outside, a cowl attached to the side of the mounting plate facing the blower and covering the flywheel with the blower and cooling-air spiral, the space covered by the cowl interconnecting the two cooling-air ducts.

3,911,877
DIVIDING CUTTING MACHINE

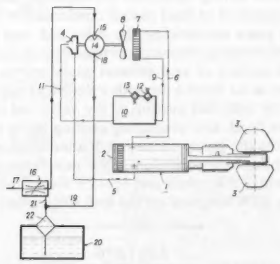
Siegfried Sigott, Hauptstr. 96; Alfred Zitz, Granitzenweg 13b; Hubert Schwelberger, Hangweg 47, and Arnold Dotsch, Hangweg 49, all of Zeltweg, Austria

Filed June 28, 1973, Ser. No. 374,320

Claims priority, application Austria, June 30, 1972, 5640/72

Int. Cl.² F01P 7/10

U.S. Cl. 123—41.49 **3 Claims**



1. A water-circulating cooling system for a water-cooled cutting motor of a dividing cutting machine provided with a hydraulic system comprising

a water pump,

a fan,

a water-cooling cooler,

water flow lines extending between and interconnecting said pump, said cooler, and the motor, and an oil-driven gear-type fluid drive driving said water pump and cooler and means to circulate oil to and from the gear-type drive, said fluid drive having a housing and a drive shaft with ends, said drive shaft extending from both sides of the housing, a fan wheel mounted on one shaft end, and an impeller of the water pump mounted on the other shaft end.

3,911,878
INTERNAL COMBUSTION ENGINE HAVING CONTINUOUS COMBUSTION

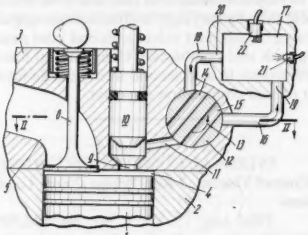
Peter Hofbauer, and Bernd Wiedemann, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 25, 1974, Ser. No. 464,327

Claims priority, application Germany, Apr. 26, 1973, 2321060

Int. Cl.² F01L 7/00

U.S. Cl. 123—80 R **9 Claims**



1. In an internal combustion engine including a plurality of cylinders, a piston arranged for reciprocating movement in each of said cylinders, a combustion chamber, means for coupling said plurality of cylinders toward the end of each compression cycle when the piston is in the vicinity of the upper dead center thereof for exchanging the compressed air within the respective cylinder with the combusted air-fuel mixture of said combustion chamber, wherein said coupling means comprises a transit valve means for each cylinder, a switching arrangement means coupled to said transit valve means for coupling said transit valve means to said combustion chamber to an input thereof at a predetermined instant for guiding compressed air to said combustion chamber and with an exit opening of said combustion chamber at another predetermined instant for guiding combusted air-fuel mixture from said combustion chamber to said cylinders.

3,911,879
VALVE ADJUSTMENT MECHANISM FOR INTERNAL COMBUSTION ENGINE

Werner Altmann, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed July 10, 1974, Ser. No. 487,135

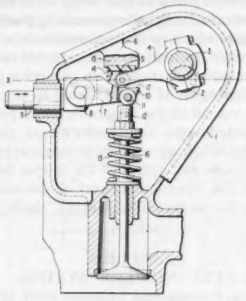
Claims priority, application Germany, July 13, 1973, 2335695; Dec. 21, 1973, 2363891

Int. Cl.² F01L 1/34

U.S. Cl. 123—90.16 **40 Claims**

1. A valve-adjusting mechanism for internal combustion engines which includes a drive shaft, a means for converting the rotary movement of the drive shaft into an up and down movement actuating a valve, and control means for changing the valve lift in dependence on at least one of rotational speed and load of an internal combustion engine, characterized in that the drive shaft, to provide the converting means, is constructed as a crankshaft reciprocating a connecting rod pivotally connected thereto between a fixed support wall means and a pivotally supported wedge-shaped adjusting means

extending at an acute angle to the fixed support wall means so that the adjusting means carries out an up and down move-



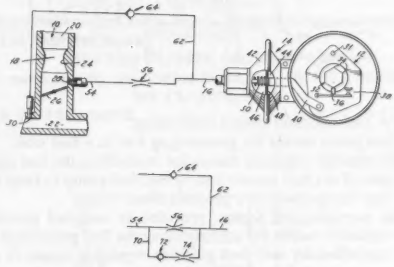
ment as a result of the wedging effect and is operative to transmit the same onto the valve.

3,911,880

SPARK DELAY DEVICE FOR INTERNAL COMBUSTION ENGINE IGNITION TIMING

Karl H. Gropp, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 30, 1973, Ser. No. 411,601
Int. Cl.² F02P *5/02*
U.S. Cl. 123—117 A **3 Claims**



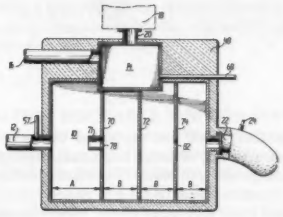
1. An engine spark timing control system comprising, a carburetor having an induction passage open to atmospheric pressure at one end and connected to engine intake manifold vacuum at the other end, a throttle valve rotatably mounted in the induction passage for movement between positions opening and closing the passage, a spark port in the passage located adjacent the edge of the throttle valve in its closed position to be traversed by the said edge as the throttle valve moves from a closed position so as to subject the spark port to changes in the intake manifold vacuum whereby spark port pressure level changes progressively from atmospheric at closed throttle valve position to the level of manifold vacuum at open throttle valve position, an engine distributor having a breaker plate pivotally movable in opposite directions to advance and retard the spark timing, vacuum controlled servo means connected to the breaker plate to move the same, a conduit connecting the spark port to the servo means, a first flow restrictor in the conduit means delaying the communication of changes in pressure levels between the spark port and the servo means, bypass conduit means connecting the spark port and servo means around the first flow restrictor, the bypass conduit means containing a second flow restrictor effective a delay of communication of changes in pressure levels between the servo means and the spark port, and further pressure responsive means operably associated with the second flow restrictor and rendered operable in response to a predetermined pressure rise at the spark port with respect to the pressure level at the servo means to render operable the second flow restrictor to operate concurrently with the first flow restrictor to control the delay of communication of the pressure change between the spark port and the servo means, the further means being rendered inoperable upon the pressure at the servo means being higher than at the spark port to render the second flow restrictor ineffective to control communication of the pressure change between the servo means and spark port.

3,911,881

COMBINED ENGINE EXHAUST AND FUEL GASIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Seth Lee, Jr., Rte. 1, Coats, N.C. 27521

Filed Aug. 31, 1973, Ser. No. 393,629
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AB **12 Claims**



1. A combined engine exhaust and fuel gasification system for an internal combustion engine comprising:

A. a first elongated chamber of thermally conductive material having inlet means for admitting a fuel and air mixture and outlet means for transmitting the mixture to the engine;

B. a second elongated chamber of thermally conductive material, the second chamber being longer than the first chamber and at least partially receiving the first chamber and having a common wall portion therewith disposed centrally and near the top of the second chamber, the second chamber further having inlet means for admitting exhaust gases from the engine and outlet means for transmitting the exhaust gases from the second chamber; and

C. a plurality of spaced baffle plates, each of the baffle plates extending entirely across the length of said second chamber and defining a plurality of apertures, the apertures defined by each baffle plate being unaligned with respect to the apertures defined by the adjacently located other baffle plates, the exhaust gases flowing from the inlet means to the outlet means through the apertures defined by said plurality of baffle plates to provide effective heat transfer to the first elongated chamber and muffle engine exhaust noise.

3,911,882

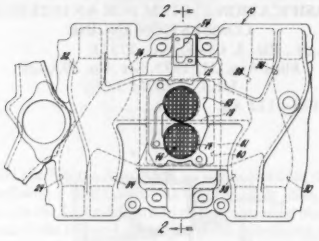
QUICK HEAT MANIFOLD ASSEMBLY

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1974, Ser. No. 460,962
Int. Cl.² F02M *31/00, 31/08, 31/12*
U.S. Cl. 123—122 AB **3 Claims**

1. A quick heat manifold assembly comprising a manifold casting having a vertical riser bore therein, means including a casting floor forming an induction plenum within said manifold casting, means forming a plurality of transverse runners in said casting in communication with said induction plenum for directing air-fuel mixture to engine cylinders, an opening

in said casting floor underlying said vertical riser bore, a sandwiched heat exchanger unit closing said opening including an inner sheet metal cover located inwardly of said hole and underlying said vertical bore and an imperforate outer sheet metal cover directed outwardly of said opening in spaced parallel relationship with said inner sheet metal cover, said inner and outer sheet metal covers each having a peripheral flange thereon joined together, means for bonding said joined together flanges continuously around the perimeter of said exchanger unit to form a peripherally sealed enclosure therein, an annular gasket carried by the peripheral flange of said inner cover, means securing said unit to said casting to locate said gasket in sealing engagement with said casting a



plurality of corrugated fins supported within said enclosure having a first plurality of bends in contact with the inner cover and a second plurality of bends in contact with the outer cover to form a separate plurality of open ended exhaust gas passes between said inner and outer cover, means forming openings through said inner cover in communication with opposite ends of said plurality of exhaust gas passes, and means in said casting for directing hot exhaust from engine cylinders through said inner cover openings for flow through said exhaust gas passes to heat said inner cover below said vertical riser bores whereby fuel droplets from said riser bores are evaporated on contact with said inner cover prior to passage through said transverse induction runners.

3,911,883

FUEL SYSTEMS FOR ENGINES

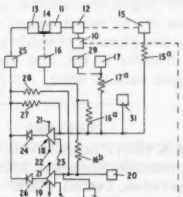
Malcolm Williams, Solihull; Geoffrey Albert Kenyon Brunt, Glastonbury, and Christopher Robin Jones, Alcester, all of England, assignors to C.A.V. Limited, Birmingham, England

Filed Apr. 4, 1973, Ser. No. 347,721

Claims priority, application United Kingdom, Apr. 4, 1972, 15346/72

Int. Cl. F02m *39/00*

U.S. Cl. 123—139 E **8 Claims**



1. A fuel system for an engine, comprising a pump for supplying fuel to the engine, an actuator for controlling the pump, an electronic governor controlling the actuator in accordance with the values of at least two parameters of the system, a supercharger for increasing the supply of air to the engine, the maximum pump output having a first level when the output of the supercharger is below a predetermined level said pump output rising to a second level when the output of the supercharger reaches and exceeds said predetermined level, said maximum pump output being set in the governor by comparing an electrical signal representing pump output with a reference signal which varies in accordance with the output of the supercharger, means for producing said reference signal said means including a transducer comprising transformer means for producing an AC signal having an amplitude dependent upon the output of the supercharger, a peak amplitude detector connected to the transformer means, the peak amplitude detector including a transistor serving to charge a capacitor during alternate half-cycles of the output from the transformer means, the conduction level of the transistor being determined by the amplitude of said a.c. signal.

3,911,884

FUEL INJECTION SYSTEM

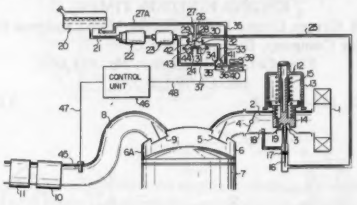
Hisanori Moriya, Katsuta, and Yasunori Mori, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 6, 1974, Ser. No. 503,954

Claims priority, application Japan, Sept. 12, 1973, 48-102111

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **4 Claims**



1. A fuel injection system comprising:

a fuel pump means for pressurizing fuel in a fuel tank;

fuel pressure regulator means for controlling the fuel pressure of the fuel pressurized by said fuel pump to keep the fuel substantially in a predetermined value;

fuel compensating means, provided in said fuel pressure regulator means, for compensating the fuel pressure to be controlled by said fuel pressure regulator means in response to the magnitude of an output signal of oxygen concentration detector means which produces a signal with a value corresponding to residual oxygen concentration in exhaust gases in an engine exhaust system; and

fuel flow control means for metering and injecting the pressure compensated fuel in acccordance with the Venturi negative pressure occurring at a Venturi portion provided in an engine suction system.

3,911,885

TORQUE RISE LIMITING GOVERNOR

James T. Hammond, Tremont, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 31, 1974, Ser. No. 519,578

Int. Cl.² F02D *1/04*

U.S. Cl. 123—140 R **9 Claims**

1. A torque rise limiting governor for controlling the position of a fuel control member of an internal combustion engine, comprising;

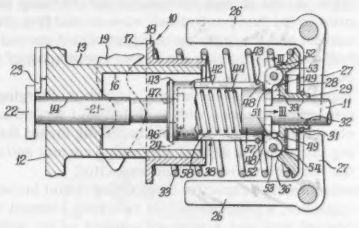
an annular collar slidably disposed on the fuel control member;

spring means resiliently urging said collar and the fuel control member in a first direction for increasing delivery of fuel to the engine;

a flyweight arrangement responsive to engine speed normally to counterbalance the bias of said spring means and

operative to permit the spring means to move the collar and the fuel control member in said first direction when the engine speed decreases due to increased loading thereon;

means for limiting movement of the fuel control member in said first direction establishing a maximum fuel delivery position of the fuel control member; and



lever means pivotally attached to the collar and engagable with the fuel control member and said limiting means for pivoting about the limiting means to move the fuel control member in a second direction for decreasing delivery of fuel to the engine when the engine speed decreases due to increased loading thereon after the fuel control member reaches its maximum fuel delivery position.

3,911,886

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

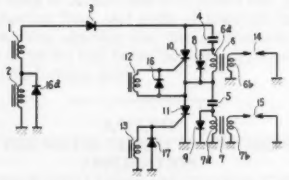
Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 31, 1974, Ser. No. 475,279

Claims priority, application Japan, July 10, 1973, 48-78058

Int. Cl.² F02G *1/00*

U.S. Cl. 123—148 R **9 Claims**



1. An ignition system for an internal combustion engine comprising;

a capacitor charging coil for generating an AC voltage;

a rectifying element, connected to said capacitor charging coil, for rectifying said AC voltage;

a capacitor connected to said capacitor charging coil through said rectifying element;

a switching element having a control gate and connected to said capacitor charging coil in parallel with said capacitor;

an ignition coil having a primary winding connected in series with said capacitor and a secondary winding;

a spark plug connected to said secondary winding of said ignition coil; and

a switching element controlling means connected to said control gate of said switching element; wherein the improvement comprises;

another capacitor connected to said capacitor charging coil through the parallel circuit of said switching element and said capacitor;

another ignition coil having a primary winding connected in series with said another capacitor and a secondary winding;

another spark plug connected to said secondary winding of said another ignition coil;

another switching element, having a control gate, and connected to said capacitor charging coil through said parallel circuit and in parallel with said another capacitor; and another switching element controlling means connected to said gate of said another switching element, said switching element controlling means being so arranged to make said switching element conductive at least when said another capacitor is to be charged and when the charge stored in said capacitor is to be discharged at the ignition timing for said spark plug, and said another switching element controlling means being so arranged to make said another switching element conductive at least when szid capacitor is to be charged and the charge stored in said another capacitor is to be discharged at the other ignition timing for said another spark plug,

each of said switching element controlling means and said another switching element controlling means respectively comprising a generating coil which generates an output voltage in synchronism with the rotation of said internal combustion engine.

3,911,887

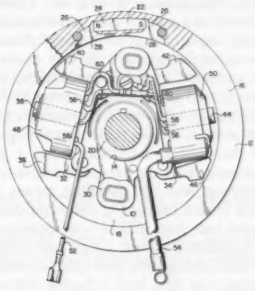
CAPACITOR DISCHARGE IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Feb. 19, 1974, Ser. No. 443,839

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 R **6 Claims**



1. A capacitor discharge ignition system for use with a spark ignited internal combustion engine, said system comprising: a capacitor, means for charging said capacitor, a voltage step-up ignition transformer having a primary coil and a secondary coil, a circuit for the discharge of said capacitor through said primary coil, said circuit including a triggered gate element having a trigger terminal, said triggered gate element being one which is normally non-conducting so as to prevent the discharge of said capacitor through said primary coil and which is triggered to a conducting state by a trigger signal applied to its trigger terminal to permit the discharge of said capacitor through said primary coil, a permanent magnet means adapted for rotation in synchronism with the operation of the engine with which said system is used, a first core of magnetic material located adjacent the path of said magnet means and having a first pole through which a pulse of flux from said magnet means passes each time said magnet means is moved past said pole in the course of its rotation, and a trigger coil mounted on said pole and connected with said trigger terminal of said triggered gate element for triggering said triggered gate element to its conducting state by the

voltage induced in said trigger coil by said flux pulse, said primary coil and secondary coil also both being mounted on said pole along with said trigger coil.

3,911,888

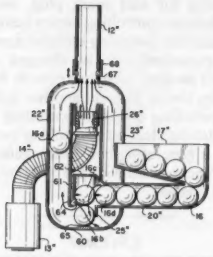
PNEUMATIC BALL THROWER WITH CONSTRICTION FORMED VACUUM FOR DRAWING BALLS FROM BALL FEED THEREOF

Tibor Horvath, 1877 E. 27th St., Brooklyn, N.Y. 11229

Filed Aug. 7, 1974, Ser. No. 495,373

Int. Cl.[2] F41F *1/04*; A63B *65/12*

U.S. Cl. 124—11 R **10 Claims**



1. A ball thrower to successively throw balls at timed intervals comprising, in combination, a barrel, an air supply, means connecting said air supply to one end of said barrel, a constriction in said means connecting said air supply to said barrel forming a vacuum between said constriction and said barrel, a timing tube communicating with said barrel between said constriction and said barrel, said barrel and said timing tube receiving balls therethrough with slight clearance, a suction bypass tube communicating with said barrel between said constriction and said barrel, ball feed means connected to said timing tube and said suction bypass tube, said suction bypass tube and said timing tube forming a branching at said ball feed means, said suction bypass tube restricting air flow therethrough so that said constriction draws a greater vacuum through said timing tube than through said suction bypass tube at said branching, and ball jamming means associated with said ball feed means preventing the expulsion of balls backward into said ball feed means, said constriction forming a vacuum to successively draw a first ball from said ball feed means into said timing tube past said suction bypass tube at said branching, the first ball reducing the vacuum of said timing tube at said branching while the first ball is within said timing tube so that said suction bypass tube holds a second ball at said branching, said jamming means limiting backward movement of the second ball while the first ball is in said barrel being expelled therefrom producing a backpressure in said timing tube and said suction bypass tube.

3,911,889

CAPACITOR DISCHARGE TYPE CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 18, 1974, Ser. No. 452,360

Claims priority, application Japan, May 8, 1973, 48-54205[U]; Mar. 29, 1973, 48-38583[U]

Int. Cl.[2] F02P *3/06*

U.S. Cl. 123—148 R **6 Claims**

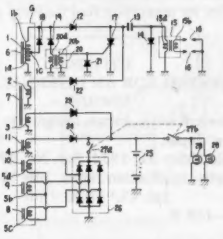
1. A capacitor discharge type contactless ignition system for an internal combustion engine comprising;

a first capacitor charging coil mounted in a magneto generator driven by an engine and for generating a first alternating current in accordance with the rotation of said magneto generator;

a second capacitor charging coil mounted in said magneto generator and for generating a second alternating current in accordance with the rotation of said magneto generator whose phase is retarded by a certain angle from that of said first alternating current, whereby when the engine rotates in an undesired direction the second positive half wave of said second alternating current being generated prior to the first positive half wave or said first alternating current and the latter certain part of said second positive half wave overlapping the former certain part of said first positive half wave;

a capacitor means forming a capacitor charging circuit connected in series with said first and second capacitor charging coils and including rectifying means for rectifying said first and second alternating current and applying the rectified current to said capacitor;

means forming a capacitor discharging circuit including said capacitor, a semi-conductor switching element having a control gate and a primary winding of an ignition coil having a primary and secondary winding;



a spark plug connected with said secondary winding of said ignition coil; and

a pulse generator connected with said control gate and for generating an ignition pulse in synchronism with the rotation of said magneto generator during the rotation of the engine in a desired direction, whereby the charge stored in said capacitor is discharged through said capacitor discharging circuit, to thereby induce a high voltage at said secondary winding to produce an ignition spark at said spark plug;

said pulse generator generating a reverse protecting pulse during the rotation of the engine in an undesired direction in order to make said semi-conductor switching element conductive for each period while said second positive half wave is generated, whereby said second positive half wave is short-circuited around said capacitor and said first positive half wave is sequentially short-circuited through said semi-conductor switching element due to the overlap of said first and second positive half wave, thus preventing said spark plug from producing an ignition spark which may otherwise keep the rotation of the engine in the undesired direction.

3,911,890
STARTING OF DIESEL ENGINES AND MIXTURE-COMPRESSING INTERNAL-COMBUSTION ENGINES

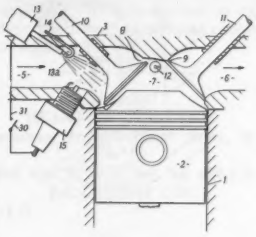
Richard Franz Karl Ansdale, 12 Roundwood Grove, Hutton Mount, Shenfield, Essex, England

Continuation-in-part of Ser. No. 233,153, March 9, 1972, abandoned. This application Dec. 18, 1973, Ser. No. 426,287

Claims priority, application United Kingdom, Mar. 21, 1971, 6793/71

Int. Cl.² F02N *17/00;* **F02M** *31/00*

U.S. Cl. 123—179 H **5 Claims**



1. An internal-combustion engine having a working chamber or working chambers, an induction system for feeding a flow of combustion air to each working chamber, said induction system including means for injecting liquid fuel into this flow of combustion air at one or more mixture-forming points of said system to form, with said flow of combustion air, a combustible mixture, an ignition device for operation in each working chamber when said chamber, after being charged with such combustible mixture, has been isolated from the induction system and the mixture in said chamber has been compressed, and a further ignition device so arranged at each mixture-forming point of the induction system as to initiate when operated combustion, in the said flow of combustion air, of the fuel injected at said mixture-forming point, the induction system being so constructed as to permit free progression of the combustion from said point of injection towards the associated working chamber and thus substantially complete combustion of all the fuel in the fuel-and-air mixture formed at such mixture-forming point.

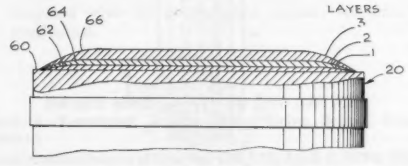
3,911,891
COATING FOR METAL SURFACES AND METHOD FOR APPLICATION

Robert D. Dowell, 23321 Falena Ave., Torrance, Calif. 90501

Filed Aug. 13, 1973, Ser. No. 387,717

Int. Cl. F02f *3/12*

U.S. Cl. 123—191 A **11 Claims**



1. A piston for use in an internal combustion engine comprising:

a substantially cylindrical member formed of metal and having a substantially flat end face; and

a coating bonded to said flat end face, said coating comprising:

a first layer of material bonded directly to said flat end face having a thermal characteristic substantially the same as that of said cylindrical member metal;

a second layer of material bonded to said first layer; and

a third layer of bonded to said second layer and having a thermal barier characteristic substantially greater than that of said cylindrical member metal, said second layer of material having a thermal expansion characteristic between that of said first and third layer materials.

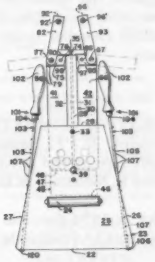
3,911,892
STOVE CONSTRUCTION

Garrett H. Harris, 157 S. Denver St., Jackson, Miss. 39209

Filed June 12, 1973, Ser. No. 369,133

Int. Cl.² F24C *1/16;* **A47J** *37/00;* **F24B** *3/00*

U.S. Cl. 126—9 R **17 Claims**



1. A solid fuel stove comprising in combination a base, a pair of fire pan means pivotally supported on the base and swingable between an open-face-to-open-face fuel-ignition-chamber-forming-relation and an end-to-end aligned open-face-up burning fuel holding relation, upper portions of the fire pan means in fuel-ignition-chamber-forming-relation forming an upright hollow enclosure having an upper open-mouth, there being air inlet means provided in the lower portions of each of fire pan means in fuel-ignition-chamber-forming-relation to permit entry of air into the enclosure.

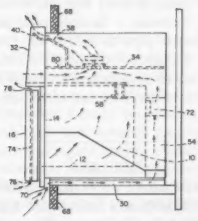
3,911,893
VENTILATING SYSTEM FOR SELF-CLEANING WALL OVEN

Gerald E. Baker, and Eugene J. Barnett, both of Mansfield, Ohio, assignors to White-Westinghouse Corporation, Cleveland, Ohio

Filed June 24, 1974, Ser. No. 482,197

Int. Cl.² F24C *15/32*

U.S. Cl. 126—21 A **4 Claims**



1. A self-cleaning wall oven comprising:

an exteriorly insulated oven liner having an open front;

a door for closing said front;

a control chamber overlying said liner and having a bottom wall spaced above the top of said liner to define an intermediate airflow passage therebetween, said chamber

having a front facing control panel assembly, said control panel assembly including inlet opening means along its lower portion to admit air into said intermediate passage, and outlet opening means along its upper portion for the passage of exhaust air from said control chamber;

an outer shell including opposite side and rear walls spaced away from the respectively facing walls of said liner to define side and rear airflow passages in communication with said intermediate airflow passage;

a blower aperture in said control chamber bottom wall, and a blower in said aperture, to draw air through said side and rear airflow passages and through said control panel assembly inlet opening means, and to force said air so drawn into said control chamber out said control panel assembly outlet openings; and

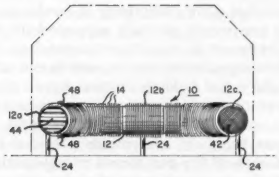
partition means extending between the opposite sides of said control chamber adjacent the front of said control chamber to separate the space immediately behind the control chamber front panel assembly from the remainder of said control chamber space through which said exhaust air passes.

3,911,894

HEATING APPARATUS

George Charles Richard, Jr., 72 Summerfield Drive; John Henry Richard, 607 Greenforest Drive, both of Baden, Pa. 15005, and Anthony L. Molennor, R.D. No. 4, Gibsonia, Pa. 15044

Filed Oct. 8, 1974, Ser. No. 513,104
Int. Cl.² F24B 7/04
U.S. Cl. 126—121 **10 Claims**



1. A portable heating apparatus for fireplaces comprising a hollow sectional tubular body of heat conducting fire resistant material, said body having a plurality of heat conducting annular ribs thereon, a plurality of legs adjustably attached to said body to adjustably position said tubular body remote from the hearth of said fireplace, said body open at each end and an electrical motor driven fan disposed at one end of thereof to force ambient air through said body, a louver disposed at the other open end of said body to selectively direct the then heated air as it leaves said body, said body having in its wall, near the louvered end, at least one air exhaust pipe having connecting means thereon, a flexible pipe adapted to be attached to said exhaust pipe to direct air from said body to other areas of the fireplace including the hearth to provide a positive source of air to said hearth to assist in starting of the fire in said fireplace, shutoff means to selectively shutoff said exhaust pipe.

3,911,895

METHOD AND APPARATUS FOR REMOVING GREASE FROM WITHIN AN EXHAUST SYSTEM

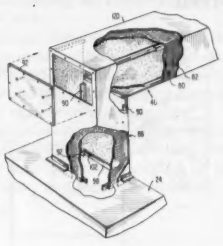
Quentin H. Van Schoyck, Christmas, Fla., assignor to Cylpik, Incorporated, Winter Park, Fla.

Filed Aug. 23, 1973, Ser. No. 390,756
Int. Cl. F24c 15/20
U.S. Cl. 126—299 A **9 Claims**

1. An exhaust duct system of the type utilized to vent grease laden vapors from a cooking facility including a canopy positioned above the cooking facility to collect grease laden vapors from the cooking facility and an exhaust duct connected to the canopy to vent the collected vapors to the atmosphere wherein the improvement comprises:

a liner removably attached to the interior surface of said canopy to provide a surface for the collection of grease and thereby isolate the canopy from the collection and buildup of grease; and

a liner removably attached to the interior surface of said exhaust duct to provide a surface for the collection of grease and thereby isolate the exhaust duct from the



collection and buildup of grease, said exhaust duct liner comprising:

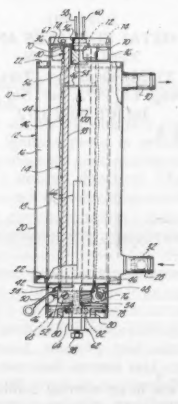
a flexible lamina including a metallic base member connected to and operably supporting an overlay of asbestos sheet material, said liner bing fashioned into four rectangular strips with each strip operable to overlie one side of a rectangular duct, each of said liner strips having embedded in the long edges thereof a flexible cable and extending within said exhaust duct in the corners thereof to conform the rectangular liner strips to the interior surface of the exhaust duct.

3,911,896

CATALYTIC HEATER

Benny J. Charboneau, Cass City, and Paul I. Nielsen, Unionville, both of Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed July 31, 1974, Ser. No. 493,709
Int. Cl.² F24H 1/00
U.S. Cl. 126—350 A **22 Claims**



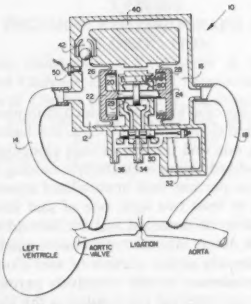
1. A flameless heater using a combustible hydrocarbon fuel for preheating liquid coolant of an internal combustion engine comprising; an elongate, cylindrically shaped heat exchanger having an inlet and an outlet for liquid coolant of an engine,

said heat exchanger being adapted to be mounted with its axis extending generally vertically, an elongate catalytic heater assembly received in said cylindrically shaped heat exchanger, said catalytic heater assembly comprising an elongate porous tube, end caps closing both ends of said porous tube, a layer of fibrous material overlying said porous tube and being impregnated with a catalytic material, an electric resistance heater element carried by said porous tube for preheating said catalytic material, and a fuel injector extending into said porous tube for discharging at least partially vaporized hydrocarbon fuel into the interior of said porous tube, whereby when a vaporized hydrocarbon fuel is discharged by said injector into said catalytic heater assembly when preheated by said electric resistance element, the fuel is oxidized by a flameless catalytic reaction to heat liquid coolant of the engine in the heat exchanger.

3,911,897
HEART ASSIST DEVICE

Frank A. Leachman, Jr., 54 Sunset Drive, Bristol, Conn. 06010

Filed Apr. 5, 1974, Ser. No. 458,535
Int. Cl.² A61F 1/24
U.S. Cl. 128—1 D **20 Claims**



16. A heart assist device for operation in synchronism with ventricular heart contractions comprising:

blood pumping means serially connectible between the heart and the vascular system of the body for producing a pulsatile blood flow; and

control means connected to the pumping means including a pressure sensor connected with a heart ventricle and detecting blood pressure pulsations produced by the contractions of the ventricle, and means responsive to the pressure sensor for driving the pumping means to maintain a programmed reference pressure at the heart ventricle during systolic contractions and to reproduce the blood flow waveform from the ventricular contractions obtained when the programmed pressure reference is maintained.

3,911,898
HEART ASSIST METHOD AND DEVICE

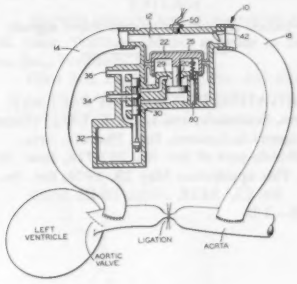
Frank A. Leachman, Jr., 54 Sunset Drive, Bristol, Conn. 06010

Continuation-in-part of Ser. No. 458,535, April 5, 1974. This application Nov. 1, 1974, Ser. No. 520,046
Int. Cl.² A61F 1/24
U.S. Cl. 128—1 D **19 Claims**

1. A counterpulsation heart assist device comprising:

blood pumping means connectible between a ventricle of the natural heart and the associated vascular system of the body, and including an expansible and contractible pumping chamber for ingesting blood from the ventricle and expelling blood into the associated vascular system; and

pumping control means connected with the heart and the pumping means for regulating the pumping means in

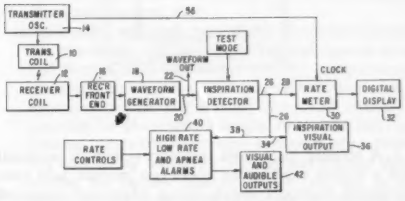


counterpulsation with the heart and including means for detecting and storing the blood flow waveform produced by the heart during systolic ventricle contractions and means for regulating the expulsion of blood from the pumping chamber to duplicate the stored flow waveform.

3,911,899
RESPIRATION MONITORING METHOD AND APPARATUS

Neil R. Hattes, Danvers, Mass., assignor to Chemetron Corporation, Chicago, Ill.

Filed Nov. 8, 1973, Ser. No. 414,041
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 S **29 Claims**



1. In a monitor, circuitry for measuring the rate of recurrence of a physiological parameter of a patient and for providing an alarm upon variation of the parameter from preselected values;

sensing means responsive to said parameter for producing a sensing signal;

first integrator means responsive to said sensing signal to produce a variable parameter signal;

second integrator means responsive to said variable parameter signal to produce a relatively stable base signal;

differential amplifier means responsive to the difference between said base and variable parameter signals to produce an electrical signal having a waveform the slope and amplitude of which varies in accordance with the parameter being monitored;

reflexive means responsive to said electrical signal for detecting said rate of recurrence, said reflexive means being responsive to a recurring slope of said waveform, whereby a waveform having a slope of a first direction initiates a pulse, said reflexive means preventing the production of a second pulse until said waveform reverses to a second direction and returns to said first direction to thereby define a complete cycle of said parameter and a recurrence of the parameter being measured;

first adjustable alarm means responsive to the rate of recurrence of said pulses to produce a first alarm signal when said rate exceeds a first preset value;

second adjustable alarm means responsive to the rate of recurrence of said pulses to produce a second alarm signal when said rate falls below a second preset value; and

indicator means responsive to said alarm signals.

3,911,900

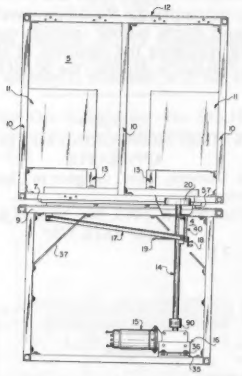
ROTATING INSTRUMENT PACKAGE

Ramon Shoen, Scottsdale, and Larry K. Long, Tempe, both of Ariz., assignors to Amerco, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 267,716, June 29, 1972, abandoned. This application May 28, 1974, Ser. No. 473,480

Int. Cl.² A61B *10/00;* **E04H** *14/00*

U.S. Cl. 128—2 D **3 Claims**



1. A rotating instrument transport system in combination with a double examination room test module, said rotating instrument transport system being interposed intermediate each room in said module such that an instrument package can be positioned for simultaneous medical testing in each room then rotated for reciprocal medical testing in each room, said instrument transport system comprising:

A. a support frame, including:

i. a pivoting tension arm pivoted to said frame at one end and including an adjustable tension means interconnecting the arm and said frame;

B. a rack rotatably mounted upon the frame by means of a ring bearing support rotatably suspended from said frame;

C. a drive motor supported upon said frame and including a rotable drive shaft and drive wheel affixed to the shaft so as to be engageable with said rack, said shaft extending through said pivoting tension arm so as to vary the degree of engagement of said wheel with said rack, according to the adjustment of said tension means and

D. a medical examination instrument package, including testing components mounted upon the rack which is positioned in turn on said ringbearing support and including:

i. independent operating controls mounted on each opposed side such that the package may be controlled independently from opposed sides and from within the examination room in which it is positioned.

3,911,901

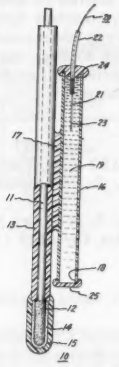
IN VIVO HYDROGEN ION SENSOR

Leonard W. Niedrach, and Oliver H. Leblanc, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 24, 1974, Ser. No. 491,771

Int. Cl.² G01N *27/46*

U.S. Cl. 128—2 E **4 Claims**



1. An in vivo specific ion sensor which comprises a flexible metallic elongated electrode lead, an electrochemically active portion coating one end portion of said elongated electrode lead, an immobilized aqueous electrolyte coating the electrochemically active portion, said immobilized aqueous electrolyte containing at least two ions, one of said ions being the same as the ion to be detected and the second of said ions being one which enters into electrochemical equilibrium with the electrochemically active portion of said elongated electrode lead, a membrane barrier selectively permeable to the ionic species to be detected encapsulating the electrochemically active portion and the electrolyte coating, electrical insulation surrounding and adhering to said elongated electrode lead except for said electrochemically active portion coating one end portion of said lead and the opposite end portion of said lead, a tube having an opening at each end substantially in juxtaposition with said flexible elongated electrode lead and electrically insulated therefrom, the tube affixed to at least a portion of said electrical insulation, an ion-permeable membrane covering the opening at one end of the tube adjacent to and spaced from said encapsulating membrane barrier, an immobilized aqueous electrolyte contained within the tube, a metallic reference electrode element partially within the tube comprising a metallic electrode lead and an electrochemically active region, said electrochemically active region of the metallic reference electrode element being in contact with the electrolyte, a seal closing the opening at the opposite end of the tube, and a portion of the metallic reference electrode element forming a lead extending externally of the tube through said seal.

3,911,902

CATHETER PRESSURE TRANSDUCER

David Thomas Delpy, London, England, assignor to National Research Development Corporation, London, England

Filed Aug. 23, 1973, Ser. No. 390,716

Claims priority, application United Kingdom, Sept. 8, 1972, 41828/72

Int. Cl.² A61B *5/02*

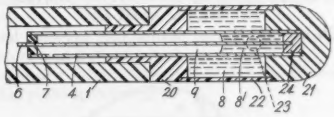
U.S. Cl. 128—2.05 D **11 Claims**

1. A pressure sensing assembly comprising:

a catheter;

a miniature pressure transducer carried by the catheter adjacent one end thereof, said transducer comprising

a substantially rigid-walled capillary tube which is open at at least one end and which contains a liquid column extending along part of the length of the tube from said one end and a gas column extending along the remainder of the length of the tube, and



a reservoir filled with liquid which communicates with the liquid column at said one end of the tube, the reservoir having a wall at least a portion of which is deformable by external pressure so as to cause a variation of the position of the gas-liquid interface in the tube; and

communication means carried by the catheter for enabling the position of said interface to be sensed at the other end of the catheter.

3,911,903

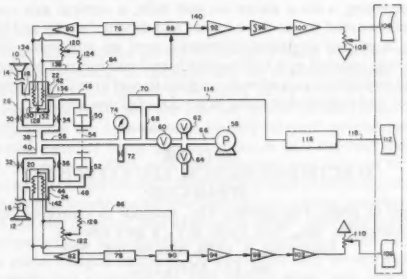
OCULAR PNEUMOPLETHYSMOGRAPH AND METHOD OF OPERATION

William Gee, Smithtown, N.Y.; Chester A. Smith, Jr., Burbank, and Clarence E. Hinsen, Chatsworth, both of Calif., assignors to Chester A. Smith, Jr., Burbank, Calif.

Filed Oct. 11, 1973, Ser. No. 405,511

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 Q **8 Claims**



5. An apparatus for simultaneously determining and comparing a pair of blood pressure pulse waves in the two ocular globes of a human being at constantly changing levels of external vacuum as an indication of blood flow through the internal carotid arteries and of collateral circulation between the body portions served by the internal carotid arteries comprising;

a. a pair of vacuum transmitting means attachable to the ocular globes to deform said globes in response to changing sub-atmospheric pressure in a system external to said globes;

b. a pair of detecting means for detecting pressure changes in said system in response to changes in the volumes of said ocular globes individually;

c. vacuum control means for continuously varying the sub-atmospheric pressure in the external system over a predetermined pressure range;

d. a pair of recording means associated individually with each of said detecting means for continuously recording the pressure changes in said system by the volume changes in each ocular globe as a differential above or below said continuously varying sub-atmospheric pressure; and

e. means for measuring and recording said continuously varying sub-atmospheric pressure.

3,911,904

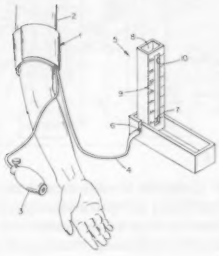
BLOOD PRESSURE MANOMETER

Joseph M. Saba, Waltham, Mass., assignor to Technical Resources, Inc., Waltham, Mass.

Filed Jan. 21, 1974, Ser. No. 435,332

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 G **2 Claims**



1. An aneroid syphgmomanometer comprising:

a pneumatic constricting cuff for wrapping around the limb of a person;

pressurizing means for pressurizing said cuff and controllably releasing said pressure; and

pressure indicating means pneumatically attached to said cuff for measuring said pressure comprising:

a housing defining an expansion channel therewithin open to atmosphere and having scale markings spaced along said channel; and

an inflatable, resiliently expandable aircontaining member attached to said housing within said channel at one end thereof, said expandable member being arranged to expand and contract without external opposition or assistance within said housing along said channel in response to pneumatic pressure from said cuff, said housing preventing width-wise expansion of said member and having means for viewing and thereby determining the variable position of the free end of said member, said scale being calibrated to measure said pressure within said cuff, whereby blood pressure may be measured by comparing the position of said free end to said scale.

3,911,905

INSTALLATION FOR MONITORING SEVERAL PERSONS OR OBJECTS

Claude Rossel, Bellmund, Switzerland, assignor to Biviator S.A., Grenchen, Switzerland

Continuation of Ser. No. 229,710, Feb. 28, 1972, abandoned.

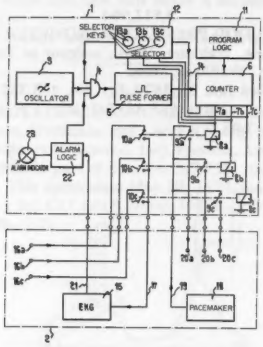
This application Mar. 20, 1974, Ser. No. 453,068

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R **7 Claims**

1. An installation for combined monitoring and influencing of a plurality of objects, comprising a plurality of input channels individually associated each with an object, common measuring and indicating means for said plurality of input channels, automatic switching means for successively connecting each of said input channels to said common measuring and indicating means, means for detecting an alarm condition in anyone of said plurality of input channels and for stopping said switching means upon detection of an alarm condition, a like plurality of output channels individually associated each with a corresponding one of said objects, common treating

means for overcoming said alarm condition of said objects, said switching means including contacts for successively interconnecting one of said output channels with said treating means in synchronism with the successive connection of corresponding input channels to said measuring and indicating means such that each pair of input and output channels associated with one object is repeatedly connected simultaneously to said measuring and indicating means and to said treating means.



3,911,906
DRY APPLIED AND OPERABLY DRY ELECTRODE DEVICE

Herbert E. Reinhold, Jr., Rockville, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Apr. 24, 1974, Ser. No. 463,784
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 E **8 Claims**

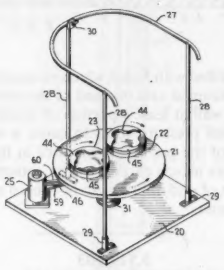
POROUS AND HYPOALLERGENIC
PRESSURE SENSITIVE ADHESIVE CONTAINING FINE ELECTRICALLY CONDUCTIVE PARTICLES
REMOVABLE SHEET WITH RELEASE AND ABRASIVE SURFACES

1. An electrode device for establishing an electrical connection between electromedical apparatus and the skin of the human anatomy, said electrode device comprising composite electrode body means for self-adhering engagement with a substantial surface area of the skin to establish the aforesaid electrical connection throughout substantially the entire engaged area of the skin without the use of conductive pastes, gels or other liquids, such as solvents or the like, said composite electrode body means including a tacky skin-engaging surface formed by a thin flexible layer of pressure sensitive adhesive material having fine non metallic electrically conductive particles dispersed throughout including said tacky skin-engaging surface in an amount sufficient to provide the aforesaid electrical connection with the engaged area of the skin through said layer by particle to particle contact while permitting the skin-engaging surface of said layer to remain tacky prior to skin engagement, removable sheet means having a release surface engaging the tacky skin-engaging surface of said layer operable to be separated therefrom without substantially reducing the tackiness thereof in response to the removal of said removable sheet means, said composite electrode body means further including carrier layer means disposed in substantially coextensive connected relation with said adhesive layer and presenting a non-tacky exterior surface generally opposed to said skin-engaging surface and electrical terminal means carried by said carrier means and forming an exterior terminal part of the aforesaid electrical connection with which a detachable electrical connection with the electromedical apparatus can be effected.

3,911,907
PLANETARY EXERCISING MACHINE

Roy V. Smith, Jr., Apalachicola, Fla., assignor to Dan E. Sangaree, Fort Myers, Fla., a part interest

Filed Aug. 6, 1974, Ser. No. 495,145
Int. Cl.² A61H 1/00
U.S. Cl. 128—24 R **6 Claims**

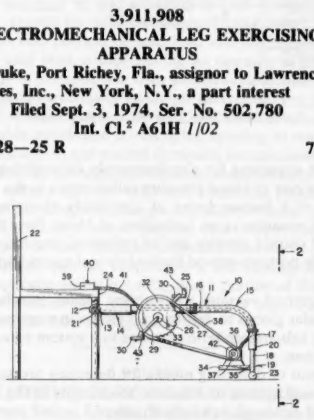


1. An exercising machine comprising a base, a vertical axis horizontal turntable journaled on said base for oscillatory movement, a pair of spaced horizontal vertical axis footrest platforms journaled on said turntable for independent rotation relative thereto, and power drive means connected with the turntable and said footrest platforms and causing the latter to oscillate in unison relative to the turntable while the turntable is oscillated relative to said base, said power drive means comprising a drive motor on said base, a vertical axis crank shaft coupled to the drive motor and driven thereby and having a pair of opposing eccentrics, and an adjustable drive linkage coupled with said turntable and said footrest platforms and including a pair of rods coupled to said crank shaft eccentrics and operated thereby in an out-of-phase mode.

3,911,908
ELECTROMECHANICAL LEG EXERCISING APPARATUS

Cecil O. Duke, Port Richey, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 3, 1974, Ser. No. 502,780
Int. Cl.² A61H 1/02
U.S. Cl. 128—25 R **7 Claims**



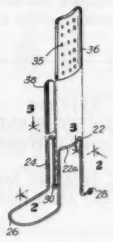
1. An electromechanical leg exercising apparatus used as a theurapeutic aid for a paraplegic patient, which comprises:
   a. a hollow tubular frame formed from three sectional telescoping members;
   b. a detachable means for attachment of said hollow tubular frame to a chair;

c. an electrical motor having an internal clutch assembly and a horizontal drive shaft;
d. a means of joining said electric motor to said hollow tubular frame;
e. a motor sprocket gear secured to said horizontal drive shaft;
f. a gear box having an S shaped shaft;
g. a pair of foot pedals pivotally affixed to the ends of said S shaped shaft;
h. a means of mounting said gear box to said hollow tubular frame;
i. a pedal sprocket gear affixed rectilinearly to a center portion of said S shaped shaft; and
j. a transmission means between said motor sprocket gear and said pedal sprocket gear.

3,911,909
FACIAL WRINKLE REMOVER

Paul L. Di Matteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Filed July 30, 1974, Ser. No. 493,078
Int. Cl.² A61F *5/08*
U.S. Cl. 128—76 B **16 Claims**



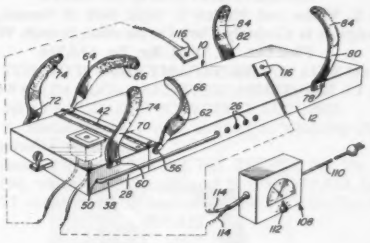
1. An arrangement for the removal of facial wrinkles on a person comprising, in combination, an external member for applying pressure against a wrinkled facial area; an internal member insertable into the interior mouth of the person directly within the area covered by said external member, said internal member being located opposite said external member, the person's flesh with said wrinkled area adapted to be held between said external member and said internal member; and connecting means for connecting said external member to said internal member, said external member, internal member and connecting means comprising substantially a continuous one piece integral element, the mouth of said person being openable and closeable by said person when said external member, internal member and connecting means are in place for removal of facial wrinkles.

3,911,910
ELECTRO-SPLINT FOR RELIEVING INVOLUNTARY MUSCULAR SPASTICITY

Robert J. Oesau, 313 Judson Place, Bridgeport, Conn. 06610

Filed May 31, 1974, Ser. No. 475,248
Int. Cl.² A61N *1/32*
U.S. Cl. 128—82.1 **9 Claims**

1. In combination, an elongated splint structure, said splint structure including means for clamp anchoring body limb portions, joined by an articulative body joint, to said aplint structure for support of said body portions in predetermined angularly related positions, said splint including switch means for actuation in response to relative angular displacement of said body limb portions in one direction from said predetermined positions thereof, said switch means being electrically connected in an electrical circuit including a pair of skin contact terminals adapted to be disposed upon skin areas overlying trigger points for a muscle bridging said joint and contractable to cause relative displacement of said limb portions in the other direction toward said predetermined positions of said limb portions, and a source of electrical potential connected in said circuit, said splint structure including a pair of elongated members lengthwise slidably supported relative to each other for shifting between extended and collapsed

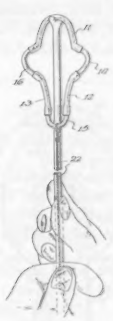


positions, each of said members including clamp means for clamping said upper and lower leg portions thereto with the said leg portions extending along said member, yieldingly expansible means carried by one of said members for engagement with and yieldingly biasing the knee joint connecting said leg portions toward a position with said leg portions substantially aligned.

3,911,911
ANTI-FERTILITY DEVICE

Antonio Scommegna, Northbrook, Ill., assignor to Michael Reese Hospital and Medical Center, Chicago, Ill.

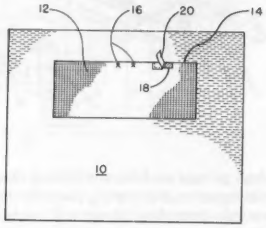
Continuation-in-part of Ser. No. 224,180, Feb. 7, 1972, which is a continuation-in-part of Ser. No. 833,472, June 16, 1969, abandoned. This application Mar. 27, 1974, Ser. No. 455,187
Int. Cl.² A61M *7/00;* **A61F** *5/46*
U.S. Cl. 128—130 **10 Claims**



1. A means for fertility control in a woman without suppressing ovulation comprising an intrauterine device comprising at least one hollow capsule containing a progestin within a partially permeable wall which permits release of said progestin therethrough at a rate not higher than about 900 micrograms per day, said device being made of at least one structural member coupled with said capsule and having a length many times greater than its cross-sectional width and thickness, said device having a stable external configuration prior to insertion into the uterus wherein both the width dimension and the longitudinal dimension of the device are greater than the cross-sectional thickness of any of said structural members

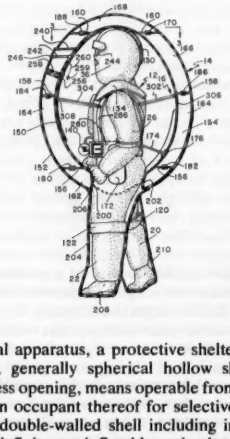
and of a size great enough to be retained in the human uterine cavity, said device including means for permitting resilient change from said stable configuration to an unstable configuration of reduced width for insertion into the human uterine cavity.

3,911,912
COMBINATION SURGICAL DRAPE
Kay E. Krebs, and Marion T. Arps, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Oct. 15, 1974, Ser. No. 514,766
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D **9 Claims**



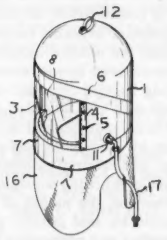
1. A surgical drape comprising,
a base sheet of dimensions at least sufficient to cover the area being draped and having a top surface and a bottom surface,
a second sheet attached to the top surface of said base sheet and having dimension substantially smaller than said base sheet,
said second sheet being adapted to wrap a body member and having adhesive means for maintaining the wrapped condition.

3,911,913
SURVIVAL APPARATUS
Ethel L. June, 4700 SE. Blvd., Wichita, Kans. 67210
Filed Oct. 5, 1973, Ser. No. 403,808
Int. Cl. A62b *7/00*
U.S. Cl. 128—142.5 **14 Claims**



1. In survival apparatus, a protective shelter comprising a double-walled, generally spherical hollow shell having an elongated access opening, means operable from the interior of the sheel by an occupant thereof for selectively closing said opening, said double-walled shell including inner and outer flexible walls defining an inflatable and substantially airtight space therebetween, connecting means in said space limiting the separation of the inner and outer walls, limb openings provided in said shell adapted to accommodate extension of the arms and legs of an occupant of the shell from the interior to the exterior of the shell, said limb openings being closed by flexible closure walls shaped to loosely embrace limbs extending through the openings closed thereby, each of said closure walls comprising a hollow enclosure having a closed end and an open end with the open end embracing and being sealed to the shell about its respective limb opening, said shell and said closure walls being so constructed and arranged to jointly envelope and isolate an occupant of the shell from any environment outside the shell, harness means fixed to the shell for releasable attachment to an occupant for stabilizing the position of an occupant relative to the shell upon any acceleration of the latter, and means disposed within and operable from within the interior of the shell by an occupant thereof for introducing a gas into the space under a pressure substantially in excess of ambient pressure whereby the shell is expanded forcefully to its generaly spherical configuration and strongly tends to retain and regain such configuration against any deforming forces, whereby an occupant of the shell can be cushioned in a collision situation as well as be shielded from ambient harmful conditions that might exist immediately subsequent to a collision, whereby an occupant in anticipation of a collision can assume the fetal position entirely within the shell with the closure walls also drawn thereinto, and whereby after the collision, the occupant can extend his arms and legs to escape from and to assist others at the collision scene.

3,911,914
VENTILATED HEAD COVER AND SAFETY HOOD
Sven-Olof Gustav Johansson, 123 Winkler, Apt. 101, Houston, Tex. 77017
Filed June 6, 1974, Ser. No. 477,093
Int. Cl.[2] A62B *18/04*
U.S. Cl. 128—142.7 **3 Claims**

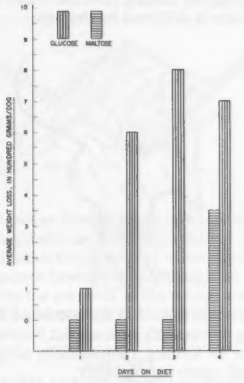


1. A ventilated hood having a rigid shell, said shell having a shield opening, a transparent shield releasably mounted over said shield opening, said shell having a user receiving opening, a flexible collar mounted on said shell, adjacent said receiving opening and an air conduit having a plurality of discharge ports mounted in said shell, said conduit having an entry at one end and extending from a point above the longitudinal center of the hood and over the inside top of the hood terminating at a point diametrically opposed to the entry point, an air connection in said shell extending transversely through one wall, said connection being movable into flow connection with the entry end of said conduit and a source of supply of air under pressure, a pair of flexible bands are stretched over and mounted on said shell, the margins of said bands adjacent said shell positioned over a portion of said shield adjacent the outer margins thereof to maintain said shield tightly against said shell and in said sealed relation with said shell.

3,911,915
DIALYTIC INTRODUCTION OF MALTOSE INTO BLOODSTREAM

Eli Seifter, New Hyde Park, and Giuseppe Rettura, Bronx, both of N.Y., assignors to Albert Einstein College of Medicine, New York, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,409
Int. Cl.² A61M *5/00, 1/03*
U.S. Cl. 128—214 R **2 Claims**

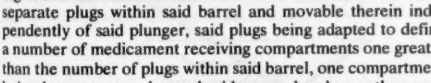


1. A method of nourishing a warm blooded animal comprising providing a solution of maltose in a pharmaceutically acceptable carrier, introducing said solution into said animals intraperitoneally, and then withdrawing said solution from said animal.

3,911,916
SEQUENTIAL INJECTION SYRINGE

Peter A. Stevens, Chesham Farm, Middlebury, Conn. 06762

Filed Oct. 29, 1971, Ser. No. 193,623
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 R **3 Claims**



1. A sequential injection syringe comprising: means defining a syringe barrel having, at one end, a cannula carried by a cannula receiving means and at the other, a grasping portion; plunger means within said barrel and having a portion extending from the barrel at said other end thereof; at least two separate plugs within said barrel and movable therein independently of said plunger, said plugs being adapted to define a number of medicament receiving compartments one greater than the number of plugs within said barrel, one compartment being between one plug and said one end and one other compartment being between another plug and said plunger; and a medicament conduit integral with the cannula on said cannula receiving means and including a tube-like element extending into said barrel from said one end thereof, the innermost end of said medicament conduit being disposed just within the plug nearest the plunger and being configured to pass through said plug and permit the entry of a medicament into said medicament conduit, said medicament conduit including additional openings intermediate its length within the barrel and equal in number to one less than the number of plugs, one of said openings being immediately adjacent said barrel one end with each additional opening being within one of said plugs, each said additional opening being spaced from the adjacent additional opening nearer said barrel one end a distance corresponding approximately to the width of the plug in which it is disposed; the width of each plug being approximately equal to the sum of the lengths of all medicament receiving spaces on the side thereof nearer said barrel one end, the length of said medicament conduit within said barrel being just slightly greater than the sum of the widths of all of said plugs.

3,911,917
INJECTOR DEVICE FOR TAMPONS OR THE LIKE MADE FROM ODOR-FREE THERMOFORMED HEAT-DEGRADED POLYVINYL ALCOHOL

David E. Hanke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 444,482, Feb. 21, 1974, Pat. No. 3,882,196, which is a continuation of Ser. No. 292,543, Sept. 27, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,835
Int. Cl.² A61F *13/20*
U.S. Cl. 128—263 **5 Claims**

1. In a disposable injector device for inserting tampons and the like into body cavities in which said device is comprised of flexible tubes made from thermoformed cold-water-soluble polyvinyl alcohol which has a percent hydrolysis in the range of 74 to about 98 and which tubes have been heat-degraded by such thermoforming to the extent that some free acetic acid is produced in the thermoformed polyvinyl alcohol tubes and is distributed throughout said thermoformed tubes, the improvement consisting of the incorporation throughout said polyvinyl alcohol before heat degradation of a proton acceptor, said proton acceptor being such that it has a pH in the range of about 7.5 to 12.0 when said proton acceptor is activated and ionized by the pick-up of moisture normally present in the ambient atmosphere, said proton acceptor being present in said thermoformed polyvinyl alcohol tubes in an amount sufficient to react with and to neutralize any of said acetic acid which is also ionized when said thermoformed polyvinyl alcohol is exposed to the moisture normally present in the ambient atmosphere, said proton acceptor being present in an amount of up to about 5 parts by weight of said polyvinyl alcohol thereby providing heat-degraded polyvinyl alcohol tubes which remain substantially free of the odor of said acetic acid.

3,911,918
BLOOD COLLECTION, STORAGE AND ADMINISTERING BAG

Ralph D. Turner, 888 Wesley Drive NE., Atlanta, Ga. 30305

Continuation-in-part of Ser. No. 243,575, April 13, 1972, abandoned. This application Apr. 3, 1974, Ser. No. 457,569
Int. Cl.² B65D *35/22;* **A61J** *1/00*
U.S. Cl. 128—272 **5 Claims**

1. A plastic bag for storing viable fluid comprising a pair of generally flat, flexible, face-to-face, opposed and peripherally joined side walls defining:

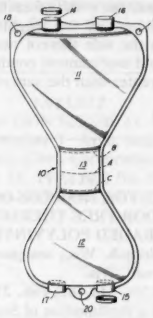
a. a relatively large upper storage compartment;

b. a relatively large lower storage compartment spaced a predetermined distance from said upper storage compartment;

c. a means for selectively defining an intermediate third compartment comprising a relatively narrow transfer conduit neck formed by a pair of rupturable seals, one at the bottom of said upper compartment and another at the top of said lower compartment, said intermediate third compartment providing fluid flow communication between the two compartments while potentially defining a third storage compartment;

d. said upper compartment tapering downwardly toward said neck to provide a progressively narrowing upper

compartment approaching said conduit neck; and,



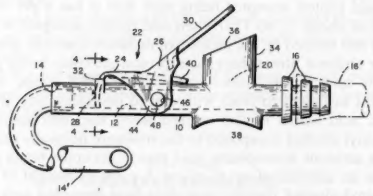
e. said side walls being normally in a collapsed condition and being deformable outwardly by receipt of the viable fluid.

3,911,919

SUCTION CATHETER

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Keene, N.H.

Filed June 6, 1974, Ser. No. 476,848
Int. Cl.² A61M *1/00*
U.S. Cl. 128—276 **14 Claims**



1. A catheter for aspiration from a body cavity of a patient comprising a catheter tube and valve having a tubular valve body containing an elongate passage and provided at its ends with means for connecting it to said catheter tube and suction tube respectively, said body containing axially spaced openings in communication with said elongate passage and closure means mounted on the body having angularly disposed closure elements so arranged that when one is engaged with one of the openings the other is retracted from another of the openings and vice versa, and wherein one closure element comprises gate means which enters the opening with which it is associated to block the passage, and the other closure element provides means for covering the opening with which it is associated and for retracting the gate means from its opening to unblock said elongate passage and wherein the closure means is yieldably held with the gate means situated within the opening with which it is associated to block the passage.

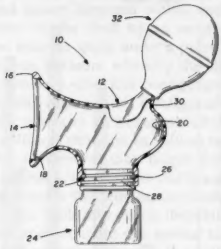
3,911,920

BREAST PUMP

Thommiss C. Susinn, 4040 Travis, Apt. 105, Dallas, Tex.

Filed Feb. 25, 1974, Ser. No. 445,253
Int. Cl.² A61M *1/00*
U.S. Cl. 128—281 **5 Claims**

1. A breast pump comprising:
a housing formed from a sterilizable material and defining a unitary, airtight structure;
a first aperture formed in one end of the housing and extending laterally with respect thereto for receiving a breast and forming a substantially airtight connection therewith;
an external rim formed around the entire periphery of the first aperture to form a substantially airtight seal with a breast inserted therein;
an internal rim formed around at least the lower portion of the first aperture to prevent milk from flowing outwardly therethrough;
a wall positioned at the opposite end of the housing from the first aperture and directly in alignment therewith whereby milk entering the housing from the breast received in the first aperture is deflected by the wall;



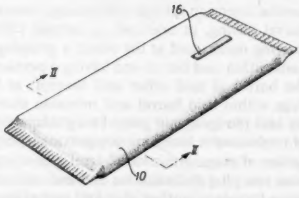
a second aperture formed in the bottom of the housing and extending downwardly with respect thereto and comprising means for forming a substantially airtight connection with a milk receiving container;
the second aperture comprising internal threads adapted for direct engagement wtih the external threads of a conventional baby bottle thereby forming a substantially airtight seal between the housing and the baby bottle;
a third aperture formed in the housing at a point displaced from the path of milk entering the housing from a breast received in the first aperture and extending upwardly relative to the housing; and
means connected to the third aperture for establishing a partial vacuum within the housing.

3,911,921

DISPOSABLE ABSORBENT PAD

Jan-Eric Svensson, Stocksund, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 7, 1974, Ser. No. 467,658
Claims priority, application Sweden, May 8, 1973, 7306424
Int. Cl.² A61F *13/16*
U.S. Cl. 128—290 R **5 Claims**

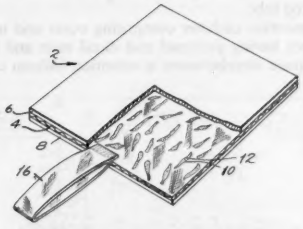


1. A disposable absorbent pad, comprising:
a web of absorbent fibrous material, there being a central portion, and a pair of 2-section marginal portions respectively secured by a longitudinal fold integrally with said central portion and both disposed in overlying relation to one side of said central portion, each of said marginal portions having had a special treatment so as to be temporarily moisture impermeable, each marginal portion being substantially twice the width of said central portion and having a central longitudinal fold between its sections whereby each said marginal portion twice overlies said central portion.

3,911,922
SURGICAL SPONGE

Herbert L. Kliger, 87 Summer St., Newton Center, Mass. 02159

Filed June 11, 1974, Ser. No. 478,334
Int. Cl.² A61F 13/00
U.S. Cl. 128—296 12 Claims

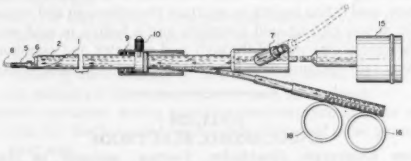


1. A surgical sponge comprising an intermediate reinforcing layer having laminated to both sides thereof a layer of an aqueous liquid absorbing flexible, water-insoluble foamed polymer, said sponge having disposed therein an X-ray opaque material whereby the presence of the sponge can be detected by X-ray if it is accidentally left in a patient.

3,911,923
OCCLUSION RING AND METHOD AND DEVICE FOR ITS APPLICATION

In Bae Yoon, 2213 Forest Ridge Road, Timonium, Md. 21093

Filed Apr. 9, 1974, Ser. No. 459,414
Int. Cl.² A61N 3/00
U.S. Cl. 128—303 A 16 Claims



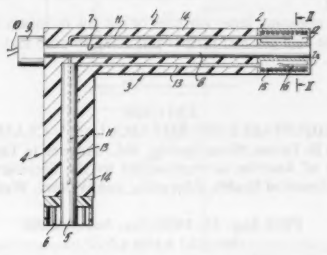
1. A ring applicator device for use in applying an elastic occluding ring to an anatomical tubular structure which comprises an inner cylinder slidable disposed within an outer cylinder, forceps means slidably disposed within said inner cylinder, said forceps means being spring loaded so that they spring open when they are displaced from the end of the inner cylinder, means for moving said forceps means into and out of the inner cylinder and means for ejecting an elastic ring from the end of said inner cylinder by axially displacing said outer and inner cylinders relative to each other.

3,911,924
CRYOPROBE

Hildebrand Zimmer, Ahrensburg, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Apr. 16, 1974, Ser. No. 461,394
Claims priority, application Germany, Apr. 19, 1973, 2319922
Int. Cl.² A61B 17/36
U.S. Cl. 128—303.1 3 Claims

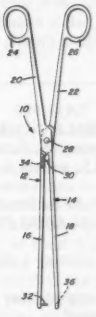
1. A cryoprobe comprising a first tubular housing portion having a rear end and a forward probe tip opposite end, said first tubular housing portion having a bore extending therethrough from said rear end to said forward probe tip end, said probe tip end having a planar annular probe tip surface around the bore, an ultrasonic conductor extending through the bore and terminating in an end surface substantially aligned with said probe tip end surface, an ultrasonic head secured to said conductor and located adjacent the rear end of said housing for transmitting sonic impulses through said conductor and for receiving reflection impulses back through said conductor, wall means defining an annular evaporation chamber in direct contact with said probe surface and extending around the bore, an electrical resistance heater in said evaporation chamber, a tubular handle portion of said housing connected to said first tubular housing portion and having a handle portion bore therethrough, a supply conduit for coolant medium extending through the handle portion bore and through said first tubular portion to said evaporation chamber, a return conduit for the coolant medium including a portion in said handle portion bore surrounding said supply conduit and a separate return conduit portion in said first housing portion connected into said evaporation chamber, and an electrical and a mechanical connection connected to said heater and to said supply and return conduits adjacent the end of said handle portion for mechanically coupling the supply and return conduits and for electrically coupling said electric resistance heater, respectively, to external sources of coolant medium and electric current.



3,911,925
EAR TRIMMING FORCEPS

Joe B. Tillery, Jr., 4560 Eastwood Road, Jackson, Miss. 39206

Filed May 23, 1974, Ser. No. 472,804
Int. Cl.² A61B 17/28, 17/00
U.S. Cl. 128—321 4 Claims



1. Forceps for use in trimming ears, comprising, in combination:

a. a pair of crossed levers arranged forming a pair of opposed jaw members and a pair of opposed handle members;

b. a pivot arranged for pivotally mounting the crossed levers for movement of the jaw members toward and away from one another;

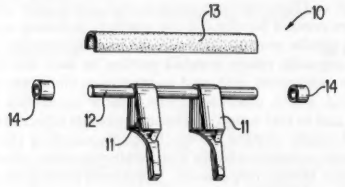
c. a pin provided on the inner surface of one of the jaw members facing the opposite jaw member and disposed adjacent the pivot for permitting the forceps to be anchored to an ear to be trimmed by being arranged in a hole in the ear;
d. a further pin and a pair of apertures provided on the opposing inner surfaces of the jaw members, the further pin being peg-shaped and spaced from the pivot and pin and adjacent the ends of the jaw members, each aperture located opposite a respective pin and arranged for selectively receiving a respective one of the pin and further pin, with the further pin functioning as an alignment pin; and
e. the opposing inner surfaces of the jaw members intermediate said pin and further pin being smooth and continuous.

3,911,926

ADJUSTABLE MICROVASCULAR U-CLAMP

Norman D. Peters, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 498,280
Int. Cl.² A61B *17/12*
U.S. Cl. 128—325 **4 Claims**



1. An adjustable microvascular clamp which comprises: a cylindrical bar having a spacer member mounted on each end of said bar; a pair of clips slidably mounted on said bar; a semi-cylindrical covering mounted on said spacer members and extending parallel to said bar; each of said clips having one end thereof located between and in engagement with said covering and said bar; said engagement providing sufficient friction upon said clips to allow said clips to be individually positioned along the bar, while maintaining said clips in position during use of said clips in closing off a blood vessel or the like.

3,911,927

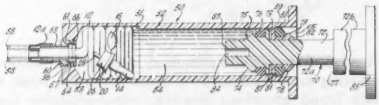
EVERSIBLE CATHETER

Ernest J. Rich, Mercer; Joseph S. Farrell, and Eric Flam, both of Middlesex, all of N.J., assignors to Princeton Biomedix, Inc., Princeton, N.J.

Filed Apr. 17, 1974, Ser. No. 461,568
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 R **9 Claims**

1. An instrument for everting a flexible tube into a body passage comprising:
a. a hollow casing having at least one opening extending through the wall thereof;
b. a connector removably secured to said casing in fluid-tight communication with said opening, said connector having a bore extending therethrough in fluid communication with the interior of said casing;
c. a flexible tube positioned substantially entirely within said casing and having one end sealed to the periphery of said bore and having means sealing the other end of said tube;
d. pressure means for increasing the pressure in the interior of said casing, said increased pressure being effective to cause said tube to evert through said bore to form a doublewalled tube; and
e. a fitting near the said other end of said tube adapted to coact with said connector after said tube has been substantially completely everted from said casing to form a doublewalled tube so that said connector and said everted double-walled tube may be removed from said casing without substantially decreasing the pressure within said everted tube.

9. A retention catheter comprising outer and inner elongated tubes having proximal and distal ends and having an annular space therebetween; a retention balloon connecting



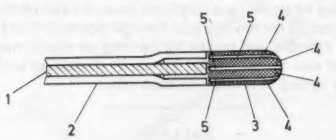
the proximal ends of said tubes and sealing the proximal end of said annular space, said balloon having a toroidal shape with a central opening therethrough; an inflation fluid filling said annular space and said balloon; a connector secured to the distal end of said outer tube and having female seating means therein; a fitting secured near the distal end of said inner tube and having male seating means in contact with said female seating means and maintaining said male and female means together so as to seal the distal end of said annular space, said fitting having an aperture therethrough and removable means closing said aperture; and a lumen in said inner tube extending entirely through said catheter and communicating said aperture with the central opening in said balloon.

3,911,928

ENDOCARDIAL ELECTRODE

Hans Lagergren, Stockholm, Sweden, assignor to Hans Lagergren, Stockholm, Sweden

Filed Apr. 11, 1974, Ser. No. 460,211
Claims priority, application Germany, Apr. 14, 1973, 2319054
Int. Cl.² A61N *1/04*
U.S. Cl. 128—418 **24 Claims**

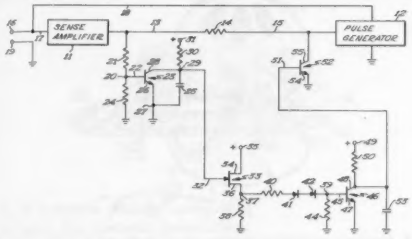


1. Endocardial electrode for the intracardial stimulation of a heart, comprising an elongate electrical conductor; an electrical insulation encasing said conductor; and an electrode head being connected to said conductor at the end thereof proximate the heart for transmission of stimulative impulses to the heart upon insertion of said electrode, said electrode head having a surface area the major portion of which is constituted of an insulating material and the relatively smaller remaining surface area of an electrically conductive contact material forming a plurality of spaced electrically conductive minute surface areas, each of said last-mentioned areas being electrically connected with said conductor.

3,911,929
DEMAND CARDIAC PACER

David H. Gobeli, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed May 20, 1974, Ser. No. 471,564
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 PG 10 Claims



1. In a demand cardiac pacer of the type having a resettable pulse generator and having sense amplifier means adapted to be connected to the heart and responsive to heart activity for generating pulse generator reset signals, the improvement which comprises:

means for establishing a first predetermined period of time; means responsive to said sense amplifier means and connected to said first time period establishing means for initiating the operation of said first time period establishing means on the occurrence of each reset signal;

means operative during said first predetermined period of time for blocking said reset signals from said pulse generator; and

means for delaying the operation of said blocking means for a second, shorter predetermined period of time following initiating the operation of said first time period establishing means.

3,911,930
METHOD AND STRUCTURE OF PREVENTING AND TREATING ILEUS, AND REDUCING ACUTE PAIN BY ELECTRICAL PULSE STIMULATION

Norman R. Hagfors, Minneapolis, and Alan C. Hymes, Minnetonka, both of Minn., assignors to Stimulation Technology, Inc., Minneapolis, Minn.

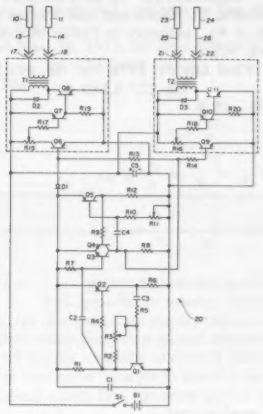
Filed Mar. 1, 1974, Ser. No. 447,164
Int. Cl.² A61N 1/36
U.S. Cl. 128—421 12 Claims

1. The method of treating pain in the human body as a result of experiencing a traumatic condition such as surgery or accidental trauma including the steps of:

a. generating a series of electrical rectangular, single frequency, fixed duration pulses within the range of 50–1000 microseconds duration and the repetition frequency range of approximately 10–300 pulses per second and of substantially constant amplitude;

b. securing at least a pair of rectangular body electrodes in juxtaposition on the skin surface and parallel to the localized area of traumatic pain in the body;

c. and applying said series of electrical pulses to said body via said electrodes with a current density of 1–50 microamperes per square millimeter continuously for a period of 20–30 minutes every 2–4 hours until the pain caused

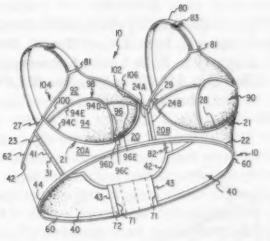


by said traumatic condition is observed to be substantially overcome.

3,911,931
BRASSIERE WITH IMPROVED BREAST CUP CONSTRUCTION

Bernard Pundyk, New York, N.Y., assignor to Glamorise Foundations, Inc., New York, N.Y.

Filed Oct. 22, 1974, Ser. No. 517,036
Int. Cl.² A41C 3/00
U.S. Cl. 128—425 5 Claims

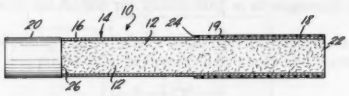


1. A brassiere comprising first and second breast cups, a front panel having first and second transversely spaced, arcuate recesses in the upper edge thereof, means for securing said breast cups along their lower edges to the edges of said front panel defining said recesses, first and second side panels secured to opposite sides of said front panel and adapted to be attached to one another at their free ends by a fastening means, and first and second shoulder straps connected between upper portions of the first and second breast cup and said first and second side panels, respectively, at locations on said side panels near the free ends thereof, said breast cups each comprising an upper section, a lower inboard section, and a lower outboard section which are sewn together along their common edges and which are shaped such that the seams thus formed do not contact the nipples of the breasts of a wearer and the breast cups conform to the natural contours of the breasts of a wearer, the upper edges of said lower inboard and lower outboard sections, which are secured to the corresponding upper section edge, being curved and forming an inverted arch at a central location on the breast cup.

3,911,932
CONTROL OF SMOKING DELIVERY THROUGH CIGARETTE PAPER POROSITY

Willie G. Houck, Jr., Richmond, and Warren E. Claflin, Bon Air, both of Va., assignors to Phillip Morris Incorporated, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,223
Int. Cl.[2] A24D 1/02
U.S. Cl. 131—15 B 9 Claims

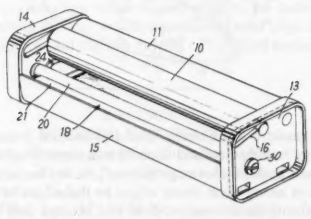


1. A smoking article comprising
an elongated cylinder of tobacco, and
a paper wrapper closely encircling said cylinder of tobacco, said wrapper having inner and outer surfaces and being sufficiently porous to admit air stream flow therethrough into said cylinder of tobacco when said smoking article is puffed during smoking, said article having a mouth end and a smoking end,
said paper wrapper being characterized by having a porosity of about 20 to about 60 seconds Griener and further by a length thereof extending from the smoking end a predetermined distance to a location intermediate said smoking and mouth ends having a coating on one of said wrapper inner and outer surfaces of a material which is effective to reduce the wrapper porosity in said length to between about 120 to about 400 seconds Griener, whereby during smoking of said article air stream flow through said first-mentioned length of said wrapper is substantially inhibited relative to air flow through the remaining length of said wrapper.

3,911,933
MANUAL CIGARETTE ROLLING MACHINES

David John Crisp, and John Robert Brown, both of London, England, assignors to Rizla Limited, Pontypridd, Wales

Filed Oct. 11, 1973, Ser. No. 405,595
Int. Cl.[2] A24C 5/44
U.S. Cl. 131—47 4 Claims

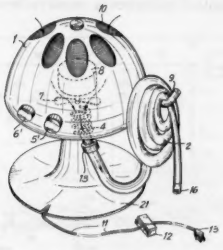


1. A manual cigarette rolling machine of the kind including an endless band manually rollable around and in contact with a fixed axis roller and a shiftable axis roller mounted in end plates of a casing, said band forming a tobacco and cigarette wrapper receiving loop between said rollers, the improvement comprising a guide member pivotally mounted in the end plates about a fixed axis and within the endless band, the said guide member having a radially extending camming surface in sliding contact with the interior surface of the band and further having a lever arm formed at one end of said guide member to enable rotation of said guide member between pre-set angular positions, said camming surface cooperating with said rollers to define a guide path for said endless band, said guide path having a length adjustable by rotataion of said camming surface of said guide means whereby the diameter of said loop may be varied.

3,911,934
HAIR DRYER

Edward Helbling, 726 E. 10th St., Brooklyn, N.Y. 11230

Filed Apr. 1, 1974, Ser. No. 457,128
Int. Cl.[2] A45D 20/00
U.S. Cl. 132—9 8 Claims

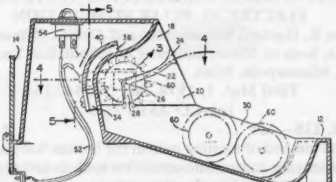


1. In a hair-grooming implement including a housing, impeller means in said housing for creating an airflow, heating means for said airflow in said housing in cascade with said impeller means, a hollow body with at least one outlet, and a conduit extending from said housing to said body for conveying a flow of hot air to said outlet, the combination therewith of first manually operable control means for said heater means, second manually operable control means for said impeller means, link means for coupling said first and second control means together, and decoupling means for selectively deactivating said link means to enable independent setting of said first and second control means, said link means being effective to translate an adjustment of one of said control means into a compensatory adjustment of the other of said control means for maintaining a substantially constant air temperature at said outlet over a range of different flow rates.

3,911,935
HAIR-SETTING DEVICE

Gus Wallin, Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Continuation of Ser. No. 127,003, March 22, 1971, which is a division of Ser. No. 848,954, Aug. 11, 1969, Pat. No. 3,594,543. This application Oct. 11, 1972, Ser. No. 296,555
Int. Cl. A45d 2/12
U.S. Cl. 132—33 11 Claims



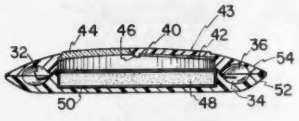
1. An electric hair-curling roller comprising a metal core plug having a flat end and a contact pin formed at the other end, a cup-shaped element snugly telescoping over the plug from the flat end, the cup-shaped element being of ferrous alloy having a preselected Curie temperature and having extending outward from its end wall a second contact pin insulated from the wall, an electric heating element while wound about the circumferential surface of the cup element

and insulated therefrom except that one end of the wire is connected to the cup, the other end of the wire being connected to the second contact pin and a plastic outer shell enclosing the assembly.

3,911,936
SEE-THROUGH COSMETIC PACKAGE

Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Jan. 14, 1974, Ser. No. 433,428
Int. Cl.² A45D *40/00*
U.S. Cl. 132—79 R **8 Claims**

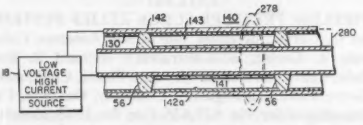


1. A cosmetic package comprising:
at least one cosmetic preparation;
housing means having at least one cavity for containing said cosmetic preparation; and
a cover hingedly mounted on said housing means being movable between an open position and a closed latched position; characterized by said cover having a transparent portion for viewing said cosmetic preparation, having on the interior of said cover a mirrored surface permitting non-distorted, reflective viewing, and having an exterior surface portion corresponding to said mirrored surface providing a decorative area.

3,911,937
ADHERENT COATING FOR CAPTIVATING SMALL PARTICLES IN GAS-INSULATED ELECTRICAL EQUIPMENT

Andreas M. Sletten, and Alan H. Cookson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 444,589, Feb. 21, 1974, Pat. No. 3,856,978. This application Oct. 2, 1974, Ser. No. 511,345
Int. Cl.² B08B *6/00*, *7/02*, *15/00*
U.S. Cl. 134—1 **12 Claims**

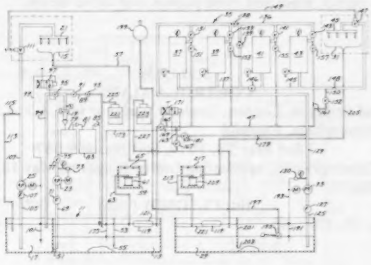


1. The method of freeing the insulating gaseous region within an enclosed electrical gaseous system containing therein spaced-apart conducting members at widely-different voltage levels of minute contaminating particles therein, which otherwise would be conducive to electrical voltage-breakdown between said spaced-apart conducting members therein at widely-different voltage levels, comprising the steps of:
a. providing a relatively-hard, uncured, resinous, insulating coating on selected surface areas within said enclosed electrical gaseous system, and,
b. subsequently changing the physical characteristics of said relatively-hard insulating coating to cause the surface of the coating to be sticky and tacky to thereby captivate the minute contaminating particles thereon.

3,911,938
FULLY AUTOMATIC VEHICLE WASH WATER RECLAIM SYSTEM

Dale E. Wiltrout, Wyckoff, N.J., assignor to The Allen Group Inc., Melville, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,807
Int. Cl.² B08B *3/02*
U.S. Cl. 134—104 **10 Claims**



1. An automatic vehicle wash water reclaim system comprising:
wash spray means for spraying water onto a vehicle passing through a wash bay formed in a vehicle path;
wash sump means disposed beneath said vehicle path for collecting used water from said vehicle path and including partition means separating said sump means into a collector compartment and a clean water compartment;
wash drain means for draining water from said vehicle path into said collector compartment;
first conduit means connected between said clean water compartment and said spray means and including first pump means for drawing water from said sump and spraying it through said spray means;
a sludge separator for separating water from sludge;
second conduit means leading from said collector compartment to the inlet of said sludge separator and including second pump means;
third conduit means leading from the water outlet from said sludge separator to said clean water compartment;
rinse spray means for spraying rinse water on a vehicle passing through a rinse bay formed in said vehicle path forwardly along said path from said wash bay;
rinse sump means including partition means separating said rinse sump means into a rinse water collector compartment and a rinse clean water compartment;
drain means for draining used rinse water from said rinse bay to said rinse sump;
rinse conduit means leading from said clean rinse water compartment and including a rinse pump means;
first and second pairs of reverse flow filter tanks having a forward and reverse flow direction;
filter conduit means leading from said rinse pump outlet to said filter tanks and connecting said filter tank inlets of said first pair in parallel with said rinse pump, the outlets of said first pair of tanks with the inlets to the second pair of tanks and connecting the outlets of said second pair of filter tanks with said rinse spray means and also connecting said rinse pump in parallel with the inlets to all of said filter tanks;
back wash conduit means connecting said filter tank inlets with said rinse sump;
individual valve means in said filter conduit means for controlling flow from said rinse pump means to the inlets of said respective filter tank inlets and operative during filtering of said wash water to direct water forwardly in parallel flow through said first pairs of tanks and then in parallel through said second pairs of tanks, said valve means being further operative during back wash of said

tanks to selectively direct flow forwardly through any selected three of said tanks and in the reverse direction through the remaining filter tank;

individual valve means in said back wash conduit means for controlling flow from said tank inlets through said back wash conduit means;

a make-up conduit means leading from the outlet from said filter tank to said wash sump; and

control means for controlling said wash pump, separator pump, wash and rinse pumps and valve means.

3,911,939

CONTROL VALVES

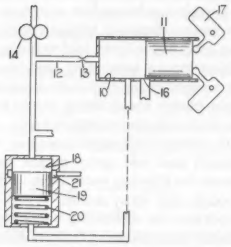
Karel Stefanek, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed May 13, 1974, Ser. No. 469,307

Claims priority, application United Kingdom, May 15, 1973, 23004/73

Int. Cl.² G05D *13/38*

U.S. Cl. 137—58 **3 Claims**



1. A pressure control valve for providing a fluid pressure which is a substantially fixed value higher than a control pressure and comprising a valve member slidable in a cylinder, a source of fluid pressure, one end of said clyinder communicating with said source of fluid pressure, a circumferential groove in said cylinder, passage means through which said groove communicates with a drain, said groove being uncovered to said one end of the cylinder as the valve member is moved towards the other end of the cylinder by the fluid pressure in said one end of the cylinder, resilient means located in said other end of the cylinder, means for generating a control pressure which is admitted to said other end of the cylinder whereby the valve member will move to control the pressure in said one end of the cylinder to a value proportional to the control pressure plus a substantially fixed value determined by said resilient means, said means comprising a further cylinder, a further valve member slidable in said further cylinder, one end of said further cylinder being in communication with a further source of fluid pressure, the fluid pressure within said further cylinder acting on said further valve member, a spill port in said further cylinder and which is progressively uncovered by said further valve member as it is moved by the fluid pressure within said further cylinder, and mechanical means for generating a force opposing movement of the further valve member by the fluid pressure, the arrangement being such that the pressure within said further cylinder is dependent upon the force generated by said mechanical means, the pressure within said further cylinder constituting the control pressure.

3,911,940

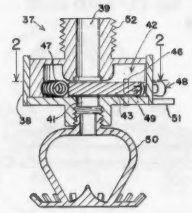
DELAYED CLOSING FIRE SPRINKLER HEADS

Wilfred V. Johnson, Oxford, Mass., assignor to U.S. Fire Control Corporation, Oxford, Mass.

Continuation-in-part of Ser. No. 143,394, May 14, 1971, Pat. No. 3,802,510. This application Sept. 24, 1973, Ser. No. 399,851

Int. Cl.² A62C *37/06*

U.S. Cl. 137—79 **12 Claims**



1. A valve assembly for use in automatic fire extinguishing systems and comprising:

a housing means defining inlet and outlet openings;

a valve member movable between closed and open positions, said valve member preventing fluid flow between said inlet and outlet when in said closed position and permitting the discharge of fluid available at said inlet opening through said outlet opening when in said open position;

actuator means for moving said valve member between said open and closed positions;

primary temperature responsive control means operatively coupled to said actuator means for automatically effecting movement of said valve member to said open position in response to ambient temperatures above a given level, and for urging said valve member toward said closed position in response to ambient temperature below said given level; and

auxiliary control means activated by opening of said valve member to automatically alter the temperature responsiveness of said primary control means so as to delay reclosure of said valve member in response to ambient temperature decreasing below said given level.

3,911,941

PIPELINE PRESSURE SURGE RELIEF SYSTEM

Charles C. Gerbic, deceased, late of San Anselmo, Calif. (by Carole A. Gerbic, administratrix); Richard S. Brumm, Orinda, Calif., and Donald M. Allen, Pinole, Calif., assignors to Grove Valve and Regulator Company, Oakland, Calif.

Continuation of Ser. No. 427,635, Dec. 26, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,537

Int. Cl.² G05D *11/13*

U.S. Cl. 137—116 **9 Claims**

1. A pressure surge relief system for a liquid-transporting pipeline comprising:

a surge relief line adapted for connection from a pipeline to a low pressure zone;

a surge reliever valve in said surge relief line;

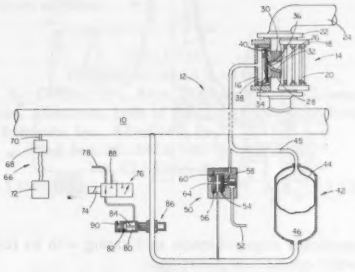
a pressure responsive member operating said surge reliever valve;

biasing means urging said pressure-responsive member in one direction to close said surge reliever valve;

a pilot conduit connected to said surge reliever valve so that fluid therein biases said pressure-responsive member in said one direction;

means exposing said pressure-responsive member to fluid in said surge relief line to bias it in the opposite direction;

a gas vessel connected to said pilot conduit;
a pilot load duct adapted to be connected to said liquid-transporting piepline;
means for maintaining the pressure in said gas vessel at the pressure in said pilot load duct;

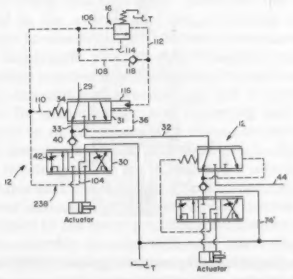


a pilot pressure set valve in said pilot load duct; and
means adapted to be installed on said pipeline operative in response to detection of a surge of pressure in said pipeline for moving said set valve toward closed position.

3,911,942
COMPENSATED MULTIFUNCTION HYDRAULIC SYSTEM

Lanson Becker, Galesburg, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,830
Int. Cl.² F15B *13/06*
U.S. Cl. 137—117 **10 Claims**

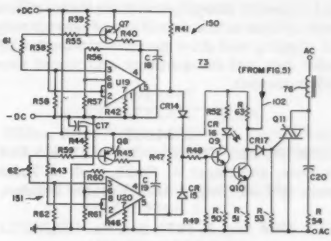


1. In a compensated multifunction hydraulic system for use with a source of hydraulic fluid including two system valve means being connected one with the other and each capable of performing a separate function, one of said system valve means including a pressure compensator communicating with a control valve, a first signal line means upstream of said control valve for moving a compensator spool in a first direction in said pressure compensator to enable said fluid to flow to the other of said system valve means, a second signal line means downstream of said control valve for moving said compensator spool in a second direction to deliver the necessary amount of hydraulic fluid to said control valve in accordance with the full needs thereof, the improvement comprising:
relief means in said second signal line means for directing fluid from said second signal line means toward said pressure compensator whereby said compensator spool moves in said first direction when said control valve is in a stalled condition.

3,911,943
CONTROL CIRCUIT FOR DISHWASHER

Stuart E. Athey, Troy; Alan Lee Vore, Franklin, and Donald E. Swihart, St. Paris, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

Division of Ser. No. 348,192, April 5, 1973, Pat. No. 3,844,299. This application Oct. 25, 1974, Ser. No. 518,171
Int. Cl.² B08B *3/02*
U.S. Cl. 137—341 **6 Claims**

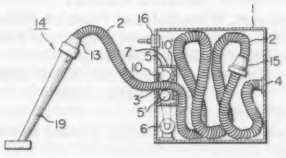


1. In a dishwasher including
means including an electric motor operated pump for recirculating washing liquid over articles placed in the dishwasher,
a storage tank for supplying heated washing liquid to said pump, and
means for heating the washing liquid in said storage tank,
the improvement comprising, in combination,
first temperature responsive resistance means in thermal relation to said motor and first electronic circuit means responsive to the resistance of said first temperature responsive means for interrupting the flow of electrical current to said motor when the motor temperature increases above a predetermined level, and
second temperature responsive resistance means in thermal contact with the liquid in said storage tank and second electronic circuit means responsive to the resistance of said second temperature responsive means for controlling said heating means to maintain said liquid at a predetermined elevated temperature.

3,911,944
APPARATUS FOR HOUSING HOSE OF SUCTION CLEANER

Hiroshi Hukuba, Nagareyama; Iwao Ikegami, Ichikawa, and Teruaki Yasuda, Tokorozawa, all of Japan, assignors to Kabushiki Kaisha Hukuba Future Research, Nagareyama, Japan

Filed Apr. 1, 1974, Ser. No. 456,461
Claims priority, application Japan, Apr. 5, 1973, 48-039339
Int. Cl.² B65H *75/34*
U.S. Cl. 137—355.2 **8 Claims**



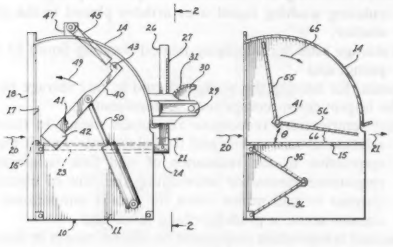
6. An apparatus adapted for attachment to a suction cleaner to facilitate the paying out and hauling in of a cleaning hose, comprising:

a housing defining therein a storage compartment, said housing having an opening formed in one side thereof;
an elongated flexible hose stored within said compartment in a random manner;
drive means for causing said hose to be paid out or hauled in through said opening, said drive means including a drive motor and a reversible rotatable roller rotatably supported adjacent said opening and positioned for engagement with said hose for causing said hose to be paid out or hauled in through said opening depending upon the direction of rotation of said roller; and
control means for stopping said drive means after a desired length of hose has been paid out of said opening and for also stopping said drive means when the hose has been hauled into said compartment and stored therein in a random manner.

3,911,945
ADJUSTABLE CONSTANT VOLUME VALVE

John D. Dyer, and Roger A. Smith, both of Tucson, Ariz., assignors to Lear Siegler, Inc., Krueger Division, Tucson, Ariz.

Filed Aug. 5, 1974, Ser. No. 494,382
Int. Cl.² G05D 7/01
U.S. Cl. 137—499 **4 Claims**



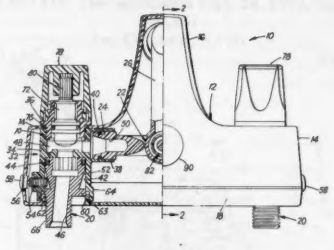
1. a fluid valve having a fluid passageway for adjustably controlling the volume rate of flow of a fluid stream flowing through said passageway comprising: a first vane pivotally mounted in said passageway for movement into said fluid stream to reduce the fluid flow passing through said passageway; a second vane connected to said first vane for transmitting force to said first vane to urge the latter into said fluid stream, said second vane positioned to be exposed to the total pressure of said fluid and to derive said force from said total pressure; biasing means urging said first vane out of said fluid stream in opposition to said force; means adjustable extending into said passageway opposite said first vane for effectively increasing or decreasing the cross-sectional area of said passageway at said first vane, said means comprising a bottom wall extending substantially parallel to the direction of fluid flow through said valve.

3,911,946
MIXING FAUCET

Jürgen Humpert, Winterhof, and Friedrich Wilhelm Bielecke, Hunschlade, both of Germany, assignors to Friedrich Grohe Armaturenfabrik, Hemer, Germany

Filed Mar. 14, 1974, Ser. No. 451,050
Int. Cl.² F16K 19/00
U.S. Cl. 137—359 **5 Claims**

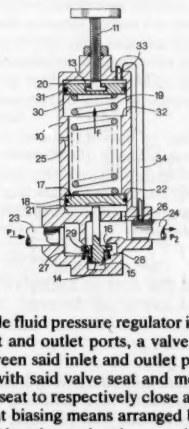
4. A mixing faucet for mounting to water connection pieces comprising:
a faucet casing having an open rear section;
a central mixing chamber casing including a pair of water inlets and a water outlet, said water inlets having generally coaxial terminal open ends, said central mixing chamber casing including said water inlet terminal ends and said outlet thereof being mounted entirely within said faucet casing;
a valve assembly mounted on each of said water inlet terminal ends, each said valve assembly being slidably telescopically engaged inside said casing with its respective water connection piece; and
said central mixing chamber casing and said valve assemblies being slidably inserted into said faucet casing through said open rear section thereof.



3,911,947
MANUALLY-ADJUSTABLE PRESSURE REGULATOR

Eric John Boxall, Haslemere, England, assignor to Martonair Limited, Middlesex, England

Filed Jan. 25, 1974, Ser. No. 436,548
Claims priority, application United Kingdom, Feb. 5, 1973, 5560/73
Int. Cl.² F16K 31/12
U.S. Cl. 137—505.14 **1 Claim**



1. An adjustable fluid pressure regulator including a housing having fluid inlet and outlet ports, a valve seat positioned in the housing between said inlet and outlet ports, a valve member engageable with said valve seat and movable toward and away from valve seat to respectively close and open said valve seat, first resilient biasing means arranged between said valve member and said housing and acting on said valve member to urge it towards said valve seat, a first chamber defined in said housing, a first piston sealingly located in said first chamber, said valve member directly engaging said first piston under the action of said first resilient biasing means, an adjustable operating member in screw-threaded engagement with said housing, a second chamber defined in said housing and spaced from said first chamber, a second piston rotatably attached to said operating member and sealingly located in said second chamber, second resilient biasing means arranged between said first and said second pistons and acting on said first piston to urge said valve member away from said valve seat, fluid conduit means interconnecting said outlet port and said first chamber to apply the outlet fluid pressure to said first piston to oppose the action of said second resilient biasing means,

and a conduit connecting said outlet port to said second chamber, whereby fluid pressure at said outlet port will act on said second piston to substantially balance the force on said operating member due to the action of said second resilient biasing means when the valve member has been moved away from said valve seat, the fluid pressure at said outlet port being predetermined by the position to which said operating member has been adjusted.

3,911,948

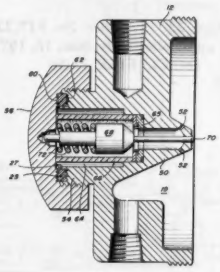
PRESSURE REGULATOR

Watson R. Collins, Jr., Fort Washington, and James J. Kokinda, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 30, 1974, Ser. No. 437,896

Int. Cl.² F16K *31/12*

U.S. Cl. 137—505.42 **3 Claims**



1. In an apparatus for maintaining constant lower pressure of a gas delivered from a relatively high pressure source, of the type including a casing having an internal flexible diaphragm dividing said casing into two major chambers, one chamber being vented to the atmosphere and containing adjustable resilient means for exerting a predetermined constant pressure against the diaphragm, and the other chamber being a gas chamber divided into two sub-chambers a first inlet sub-chamber for receiving said high pressure gas and a second outlet sub-chamber for accumulating and delivering said gas at a lower pressure to outlet means with valve-controlled means connectable between said first and second sub-chambers to regulate the pressure of said gas in said outlet sub-chamber; a removable valve seat insert ring of an elastomeric material or metal covered elastomeric material whose central opening provides the inlet to the lower pressure gas chamber, a spring-loaded valve assembly co-axial with said insert ring and including a conical valve member movable along the common axis and being constantly urged by its valve spring toward the seating engagement about the inner perimeter of said insert ring opening; and means associated with the forward end of said conical valve member and with the central portion of said diaphragm to effect movement of said valve member in accordance with the movement of said diaphragm resulting from an imbalance between the force exerted upon said diaphragm by said resilient means within the vented chamber and the force exerted oppositely thereon by the gas pressure within said gas chamber, the improvement which comprises:

a composite valve seat insert comprising a pair of flat, cylindrical, metallic washer-like members held in face to face relationship;

the first of said pair of washers having an annular recess in the face that is not in contact with the second of said pair of washers;

the first and second of said washers having means on their respective inside diameters to hold an insert member when said first and second washers are assembled in face to face relationship;

a first resilient member dispersed in the annular recess in said first washer;

a second resilient insert member disposed within and held by the holding means as defined by the assembled first and second washers, said second resilient member is in the shape of a stepped flange with the projecting inside diameter edge chamfered to facilitate more intimate contact with said spring-loaded valve;

said valve seat constructed and disposed within said apparatus so that if said first and second resilient members are consumed by combustion the remaining valve seat members will retain their relationship and provide a metal-to-metal seal between said valve seat assembly, said valve and said gas chamber.

3,911,949

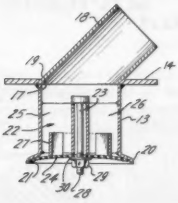
SAFETY FUELING VALVE

Noel W. Hilden, River Vale, and Peter J. Regna, Englewood Cliffs, both of N.J., assignors to Aero Tec Laboratories Inc., Waldwick, N.J.

Filed Dec. 3, 1973, Ser. No. 421,046

Int. Cl.² F16K *15/00*

U.S. Cl. 137—525 **3 Claims**



1. A safety fueling valve for vehicle fuel systems and the like comprising

a valve body having a passageway therethrough, said valve body having first and second substantially cylindrical valve body portions, said first valve body portion having a valve seat surrounding said passageway at one of the ends of the first valve body portion and being joined to said second valve body portion at the other end thereof, the said first valve body portion having a larger diameter than the second valve body portion and having the longitudinal axis thereof disposed at an obtuse angle with respect to the longitudinal axis of said second valve body portion to provide a smooth transition between said valve body portions of different diameter;

flange means on said first valve body portion at said one end thereof for mounting said valve body on a vehicle fuel tank with said passageway extending through the walls of the tank, said first valve body portion disposed in the interior of the tank, and said second valve body portion disposed exteriorly of the tank to provide a filler neck for receiving a fueling nozzle;

a valve member of flexible resilient material provided for engaging said valve seat to seal said passageway, said valve member having a centrally disposed aperture therein;

a vane assembly comprising a plurality of fluid-directing radially-extending intersecting vanes mounted in said passageway in said first valve body portion with the intersection of said vanes extending along the longitudinal axis of said passageway and one of the ends of each vane adjacent said one end of the first valve body portion to channel fuel flow through said passageway and prevent turbulence therein, each of said vanes comprising a thin substantially flat plate extending along said first valve body portion for a substantial part of the length of said first valve body portion, the said one end of each vane being curved to provide a concavo-convex curvature for

the end of the vane assembly adjacent said one end of the first valve body portion;

a support rod mounted on said vane assembly along the intersection of said vanes and passing through the aperture in said valve member for supporting said valve member;

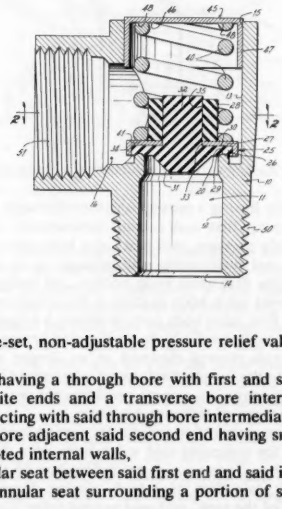
means mounted on said support rod to force said valve member into engagement with said valve seat and said one end of each of said vanes, so that fuel flowing into the valve body through said second valve body portion forces said valve member out of engagement with said valve seat to permit fuel to enter the tank and fuel flowing into said valve body from the tank forces said valve member to engage said valve seat and said one end of each of said vanes to prevent fuel from escaping from the tank; and

protective means surrounding said valve member and said valve seat for preventing debris in the interior of the tank from interfering with valve operation.

3,911,950
PRE-SET PRESSURE RELIEF VALVE

Walter D. Lowe, and Jacek Pawlowski, both of Toronto, Canada, assignors to Lunkenheimer, Cincinnati, Ohio

Filed May 3, 1974, Ser. No. 466,720
Int. Cl.² F16K *15/02*
U.S. Cl. 137—543.17 **7 Claims**



2. A pre-set, non-adjustable pressure relief valve comprising:

a body having a through bore with first and second open opposite ends and a transverse bore intersecting and connecting with said through bore intermediate said ends, said bore adjacent said second end having smooth uninterrupted internal walls,

an annular seat between said first end and said intersection, said annular seat surrounding a portion of said through bore,

sealing means cooperating with said seat to close said through bore, said sealing means including,

a resilient sealing disc having a flat circular forward sealing face engaging said seat and a projection extending from a rear side of said disc rearwardly toward said second end, the diameter of said disc being at least as great as that of said seat,

a washer having a diameter at least equal to that of said circular seat and disposed against the rear side of said disc in supporting relationship, said washer having a depending annular flange surrounding a periphery of said disc,

a hole in said washer, said projection extending therethrough, and

resilient tube means surrounding said projection and engaging and holding said washer against said disc,

said valve further including,

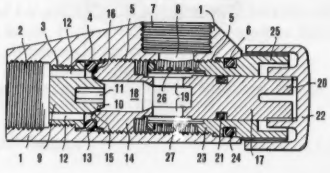
a retainer frictionally secured in said through bore and closing said through bore at said second end, said retainer being cup-shaped and including a flat bottom and an annular skirt surrounding said bottom and having external walls adapted for a frictional fit within said through bore,

spring means between the flat bottom of said retainer and said sealing means for biasing said sealing means toward said first end and for holding said sealing means against said seat, said retainer being pressed into said through bore at said second end without restriction, except for said friction fit and the bias of said spring means, such that a predetermined sealing pressure between said seat and said sealing means is provided by the selected assembly position of the retainer with respect to said seat within said through bore.

3,911,951
COCK FOR HYDRAULIC SYSTEMS, PARTICULARLY SUITABLE AS CUTOFF COCK

Alfons Knapp, Bleicherstrasse 3, Biberach an der Riss, Germany

Filed Oct. 23, 1974, Ser. No. 517,226
Claims priority, application Italy, Nov. 16, 1973, 70368/73
Int. Cl.² F16K *31/50*
U.S. Cl. 137—550 **6 Claims**



1. A cock for hydraulic systems comprising a body, in said body an inlet union, a delivery union and an inner cavity communicating with both said inlet and delivery unions, a seat member fixed in said inner cavity near said inlet union said seat member having opposite said inlet union a central impervious tapered protrusion and, around said protrusion, a number of through passages for water, and a valve member movable in said inner cavity between said seat member and said delivery union, said valve member having an annular concave sealing portion facing said seat member and cooperable with said tapered protrusion for intercepting the water flow, an inner bore opening in the center of said annular sealing portion and cross passages communicating said inner bore with said delivery union, whereby in the open position of the cock a passage for the water is defined between said tapered protrusion and concave sealing portion of the valve, said passage being free from sudden variations of the direction.

3,911,952
MECHANISM FOR CONTROLLED AIR DELIVERY TO AN AIR OPERATED ROTARY BODY

Eisuke Sugahara; Yusaku Yagi, both of Tokyo, and Akihito Owada, Warabi, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Japan

Filed June 3, 1974, Ser. No. 476,027
Claims priority, application Japan, June 1, 1973, 48-62393
Int. Cl.² E03B *1/00*; F16D *25/00*
U.S. Cl. 137—580 **6 Claims**

1. A fluid-operated apparatus comprising:

a rotary fluid-operated body,

a rotary member, and

a stationary member,

said rotary member and said stationary member having axial confronting end faces,

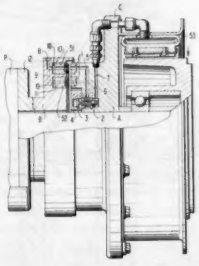
said stationary member being provided with first and second circumferential grooves on the end face thereof facing the opposed end face of said rotary member,

first and second annular pistons positioned within respective grooves,

means for supplying pressurized fluid to said grooves for forcing said pistons towards said rotary member end face, passages within said pistons at spaced circumferential positions and in fluid communication with said fluid supply means,

said rotary member including first fluid passage means leading from said rotary member end face and in alignment with the passages within the pistons within one of said grooves of said stationary member,

said fluid passage means leading to said rotary fluid-operated body,



check valves within said rotary member first fluid passage means,

annular ventilation pistons carried by said rotary member and operatively positioned respectively with respect to said check valves, and

second fluid passage means within said rotary member opening onto said end face in alignment with the fluid passage of said other annular piston within said stationary member and being operatively coupled to said ventilation pistons,

whereby; selective delivery of pressurized fluid by way of said first and second annular pistons within said stationary member causes fluid pressure to be applied to said rotary fluid-operated body or to be relieved therefrom.

3,911,953

THREE-PLENUM MIXING DAMPERS

Allen P. Crombie, and Roy M. Steege, both of Portland, Oreg., assignors to Northwest Engineering Service, Inc., Tigard, Oreg.

Filed July 5, 1974, Ser. No. 485,969
Int. Cl.² F28F *27/02;* **F16K** *11/10*
U.S. Cl. 137—595 **12 Claims**

1. In a three-plenum damper,

a by-pass air passage,

a warm air passage,

a cold aid passage,

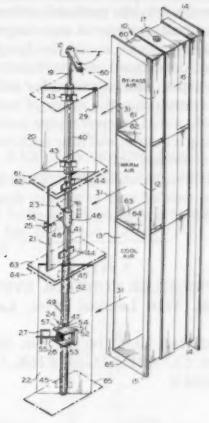
a by-pass blade movable in the by-pass passage between a first closed position through an open position and a second closed position,

a warm air blade movable in the warm air passage between a closed position and an open position,

a cold aid blade movable in the cold air passage between a closed position and an open position,

drive means for driving the by-pass blade between the first and second closed positions thereof,

first resilient coupling means driven by the drive means for moving the warm air blade from the open position thereof to the closed position thereof when the by-pass blade is moved from its first closed position to its open position and for holding the warm air blade in its closed position while the by-pass blade is moved between its open position and its second closed position, and second resilient coupling means for moving the cold air blade from its closed position to its open position while the by-pass



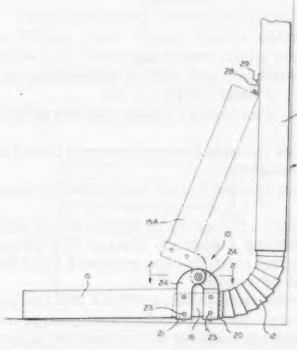
blade is moved from its open position to its second closed position and for holding the cold air blade in its closed position while the by-pass blade is moved between its open position and its first closed position.

3,911,954

HINGED EXTENSION FOR RAINPIPE DOWNSPOUTS

Paul J. Johnson, 8317 Chestnut St., Wauwatosa, Wis. 53213

Continuation-in-part of Ser. No. 466,017, May 1, 1974, Pat. No. 3,861,419. This application Jan. 17, 1975, Ser. No. 541,711
Int. Cl.² F16L *27/00*
U.S. Cl. 137—615 **6 Claims**



1. An apparatus for pivotally joining a rainpipe downspout to an extension pipe, said apparatus comprising:

hinge means coupled to adjoining ends of said downspout and said extension pipe for enabling said extension pipe to be pivoted between a first position in which said end of said extension pipe is substantially coaxial with but axially spaced apart from said end of said downspout and a second position in which said extension pipe extends generally transverse to said first position, said hinge means comprising first and second bracket means coupled to said ends of said downspout and extension pipe

respectively and means pivotally joining said first and second bracket means,

each of said first and second bracket means having a generally U-shaped configuration for receiving said ends of said downspout and extension therein, the sides of each of said bracket means having portions extending beyond the periphery of said downspout and extension pipe,

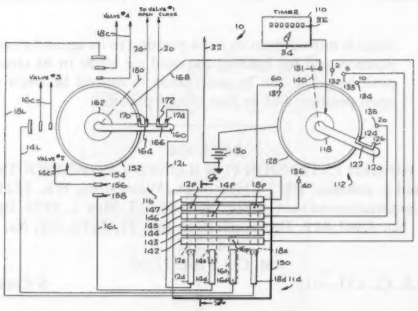
resilient coupling sleeve means bridging the axial space between said downspout and extension and affixed to one of said downspout and extension for sealingly engaging in telescopic relationship the other of said downspout and extension when said extension pipe is in said first position and providing a continuous flow path between said downspout and extension and

said joining means extends generally perpendicular to the longitudinal axis of said extension pipe and coupled to said portions of said bracket sides.

3,911,955
SPRINKLER CONTROL SYSTEM

Gustav A. Link, 3710 Lomitas Drive, Los Angeles, Calif. 90032

Filed Mar. 29, 1974, Ser. No. 456,260
Int. Cl.[2] A01G *25/16;* **F16K** *31/42*
U.S. Cl. 137—624.2 **5 Claims**



1. A sprinkler system comprising

a central station having an electric energizing signal source, a plurality of water valves,

each of said valves having a passageway with an inlet and an outlet,

a valve closer movable between open and closed positions in said passageway,

piston means coupled to said valve closer to operate said closer,

means defining a first cavity facing one side of said piston, means forming a normally blocked first passage connected to said cavity to carry pressured water thereto to open said valve closer,

a start solenoid energizable to unblock said first passage,

means forming a normally blocked drain passage connected to said cavity to drain off water therefrom to permit said valve closer to close, and a stop solenoid energizable to open said drain passage;

a plurality of conductors at said central station,

timing switch means at said central station to apply short signal pulses from said signal source at timed intervals sequentially to different ones of said conductors,

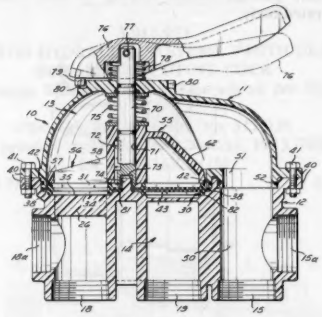
a plurality of switch members manually settable into contact with different ones of said conductors,

means comprising a distributor at said central station arranged to successively electrically connect the solenoids of different valves to said switch members for successively conditioning the said start and stop solenoids of said different ones of said valves to be energized by said signal pulses whereby operation of said timing switch means sends sequential pulses, through said switch members, to said start and stop solenoids conditioned by said distributor.

3,911,956
MULTIPORT VALVE

Edward T. LeBreton, Mentor, and Arthur J. Wiltshire, Richmond Heights, both of Ohio, assignors to Pacific Fabrication, Inc., El Monte, Calif.

Filed Sept. 24, 1973, Ser. No. 400,011
Int. Cl.[2] F16K *7/16;* **B01D** *23/24*
U.S. Cl. 137—625.46 **8 Claims**



1. A multiport valve for selectively connecting a plurality of valve ports to one another comprising a valve body, said valve body having separable body sections defining first and second chambers, a plurality of inlet and outlet ports in said valve body with all of said ports being located in the body section defining said second chamber, valving means separating said first and second chambers and including means to provide selective communication between the first chamber and at least one port, to provide selective communication among the ports, and to block communication between the chambers, said body sections being separable adjacent a plane passing through said valving means, passage means defined by both body sections providing fluid communication from an inlet port to said first chamber, said passage means being laterally offset from said valving means and being isolated from said valving means by wall means, said valving means including a gasket between said switch plate and said partition means, the periphery of said gasket being clamped between said body sections to provide a fluid seal for those sections, said gasket having a relatively incompressible core and a relatively compressible case, said case being relatively thick in portions positioned between said switch plate and said partition means and being relatively thin in portions clamped between said body sections.

3,911,957
SEAL

Malcolm M. McQueen, 19430 Marilla St., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 280,481, Aug. 14, 1972, abandoned. This application July 12, 1974, Ser. No. 487,859
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—625.48 **9 Claims**

1. An improved valve, comprising, in combination,

a housing having a closed end and a wall defining a hollow central bore, and an inlet and first and second outlets communicating with said bore, said inlet being located above said first and second outlets

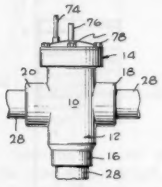
a valve body in said bore disposed in sliding engagement with said wall, said valve body including:

a generally central longitudinally extending passageway communicating with said second outlet,

a cage portion forming part of said valve body and located adjacent one end thereof and defining a first annular passageway communicating with said central passageway, a pair of spaced annular members with bearing surfaces contacting the inner surface of said wall, each of said members including an annular groove, and

a second annular passageway between said spaced members and in communication with said first outlet,

a resilient seat member seated within said valve body at the end thereof opposite said cage portion and positioning



said valve body into a first position for communication of said inlet with said second annular passageway,

biasing means connected in sealing engagement with said housing adjacent the cage end of said valve body, for controllably biasing said valve body against said seat member into a second position for communication of said inlet with said first annular passageway, and

a pair of O-rings, each O-ring being disposed in one of said annular grooves and in sliding engagement with said wall, said O-rings being out of contact with said inlet and outlets when said valve body is in either of said first and second positions.

3,911,958

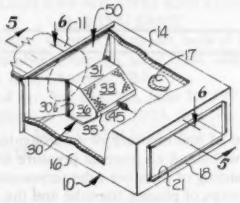
LOW NOISE LEVEL AIR FLOW CONTROL UNIT

Hillard Glenn Logsdon, Charlotte, N.C., assignor to Aeronca, Inc., Pineville, N.C.

Filed Feb. 1, 1974, Ser. No. 438,573

Int. Cl.² G05D *16/06*

U.S. Cl. 137—798 **5 Claims**



1. A control unit for an air distributing system comprising a main housing having opposing pairs of side walls and an end wall, said end wall having an air inlet adapted for the flow of an airstream therethrough, an air volume regulator within said housing and comprising a regulator housing having an inlet end and being of substantially smaller external dimensions than the internal dimensions of said main housing, conduit means supporting said air volume regulator so as to dampen the vibrations produced by the flow of air therethrough to reduce the noises created by the air volume regulator being transferred to said main housing, said conduit means comprising a duct having a minimum length in the direction of flow of the airstream therethrough of about six inches and having flanged opposite ends, said duct communicating with and extending between said air inlet and the inlet end of said air volume regulator and being positioned out of contact with the side walls of said main housing, and said duct having one flanged end secured to the inlet end of said regulator housing and having its other flanged end secured to and supported by said end wall of said main housing so as to support said air volume regulator out of contact with the side walls of the main housing, said flanged ends of said duct facilitating connecting the ends of the duct to said air volume regulator and said main housing end wall and also serving to interrupt the flow of vibrations from the volume regulator to the main housing.

3,911,959

EARLY-WARNING HOSE

Eugene P. Frank, 13260 Findlay Ave., Apple Valley, Minn. 55124

Filed June 21, 1974, Ser. No. 481,905

Int. Cl.² F16L *55/00, 11/12*

U.S. Cl. 138—36 **2 Claims**

1. An early warning hose comprising an inner hose of opaque material and a coaxially disposed outer hose of transparent of translucent material, the outer diameter of said inner hose being slightly smaller than the inner diameter of said outer hose to define a radial clearance, whereby liquid seeping from said inner hose will be visible through said outer hose.

3,911,960

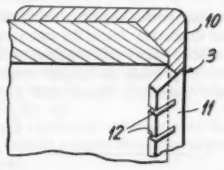
END-PIECE FOR TUBULAR ELEMENTS

Jacques Flimon, Saint Mande, France, assignor to Flimon Industrie S.A., Montreuil, France

Filed June 4, 1973, Ser. No. 366,353

Int. Cl.² B65D *59/00*

U.S. Cl. 138—96 R **6 Claims**



1. A one-piece protective end piece for tubular elements having chamfers at their ends, comprising in succession a generally cylindrical peripheral skirt adapted to fit onto an outer wall of a said tubular element, a corner portion of extra thickness acting as a stiffening zone with an inclined inner annular surface adapted to accommodate the chamfer on the tubular element, a resilient frusto-conical flange member extending inwardly of the portion of extra thickness, said resilient flange member being adapted to be normally out of contact with an inner wall of the tubular element and inclined relative thereto but being adapted to be brought into contact with the inner wall of the tubular element when gripped by a lifting or handling hook for lifting or handling operations, and means in said flange member for enabling local deformation

of said flange member when it is gripped by a lifting or handling hook so that only part of said flange member is brought into contact with the inner wall of the tubular element.

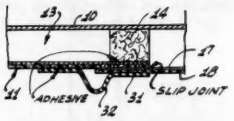
3,911,961
HIGH TEMPERATURE DUCT INSULATOR AND METHOD OF MAKING SAME

John F. Peyton, Long Beach; Juan Gonzalez, Jr., Garden Grove, and Robert B. Trelease, Los Angeles, all of Calif., assignors to Federal-Mogul Corporation, Detroit, Mich.

Continuation of Ser. No. 75,691, Sept. 25, 1970, abandoned. This application Feb. 19, 1974, Ser. No. 443,421

Int. Cl.² F16L *9/18*

U.S. Cl. 138—113 **9 Claims**



1. A lightweight, reflective, airgap insulator for high temperature ducts consisting of:

a laminated tubular insulated sleeve including a resin impregnated fabric and a layer of thin metal foil initimately impressed on said sheet and defining the inner wall surface of said sleeve, the inner and outer surface of said insulative sleeve having a rigidizing contour consisting of alternate depressed and raised portions;

a single longitudinally extending joint defined on said sleeve by overlapping longitudinally extending edge portions thereof, a first one of said edge portions having a thermally set resin impregnated strip of fiber cured thereon, said strip having one edge portion disposed to define a gap that matingly receives the other of said edge portions of said insulative sleeve therein, an adhesive sealant disposed along said joint to define a fluid tight seal therealong; and

at least one annular offset member secured to the inner surface of said insulative sleeve for carrying a duct to be insulated in spaced apart relationship to said insulative sleeve thereby to provide an airgap between the inner surface of said insulative sleeve and a duct disposed therein.

3,911,962
FIRE-RESISTANT FLEXIBLE TUBES

Max Chomat, and Jacques Proriol, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

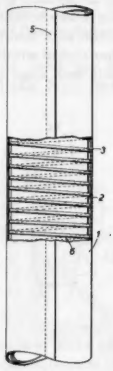
Filed May 18, 1973, Ser. No. 361,573

Claims priority, application France, May 19, 1972, 72.18057

Int. Cl.² F16L *11/02*

U.S. Cl. 138—125 **8 Claims**

1. A lightweight fire-resistant flexible tube comprising at least one fabric woven from fibres of a material selected from the group consisting of glass, a rigid supporting helix glued to said fabric, the rigid helix being formed from a circular hollow braid of glass fibres, the braid having an external diameter of 0.8 to 1.8 mm, and being stiffened by a heat-resistant resin selected from the group consisting of organo-silicone resins



and polyimide resins, the weight of heat resistant resin being from 5 to 35% of the weight of the braid.

3,911,963
METHOD OF MANUFACTURE OF AN ELONGATED ENCLOSURE OF REVOLUTION

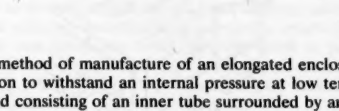
Gaston Denoor, Grenoble, France, and Geoffrey David Ransford, Toronto, Canada, assignors to B.V.S., Grenoble, France and Foundation of Canada Engineering Corporation Ltd., Toronto, Canada

Filed Nov. 16, 1973, Ser. No. 416,449

Claims priority, application France, Nov. 20, 1972, 72.41108

Int. Cl.² F16L *9/14;* **B23Q** *17/00*

U.S. Cl. 138—140 **9 Claims**



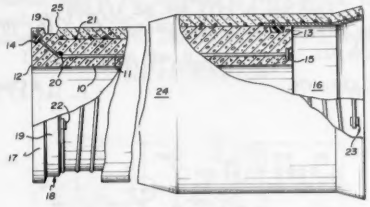
1. A method of manufacture of an elongated enclosure of revolution to withstand an internal pressure at low temperatures and consisting of an inner tube surrounded by an outer envelope, the steps of placing the tube and the envelope in an initial state at ambient temperature and without internal pressure, such that under working temperatures and pressures the stresses due to the internal pressure offset the stresses due to the relative contraction of the tube and the envelope and then subjecting the enclosure to internal pressure at low temperatures, including the steps of first selecting the radius of the tube, the materials and the thicknesses of the tube and of the envelope according to working requirements, then determining an initial difference in radius between the envelope and the tube whereby the working stresses remain within permissible limits, then placing the envelope and the tube in said initial state and including the steps of gauging the envelope and the tube to the required dimensions, then mounting the tube in the envelope and the enclosure thus formed being then subjected to said working conditions.

2. A tube produced by a method according to claim 1.

3,911,964
PRESTRESSED CONCRETE PIPES

Robert E. Bald, Roseland, N.J., assignor to Interpace Corporation, Parsippany, N.J.

Filed Apr. 29, 1974, Ser. No. 465,341
Int. Cl.² F16L 9/08
U.S. Cl. 138—176 4 Claims

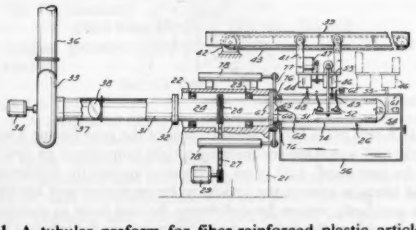


1. A prestressed concrete pressure pipe comprising a moulded concrete pipe core with a spigot having an annular surface for engaging joint sealing means, a tensioned wire wrapping subjecting the core to circumferential compression, said wrapping having an end anchored short of said joint sealing means surface, said core containing a plurality of pretensioned wires spaced apart circumferentially of said core and extending substantially the length of the core, a pretensioned hoop contained in the concrete of said core, said hoop substantially concentric to the axis of said core and located axially inward from the end face of the core at the spigot end of the core, said pretensioned wires passing through said hoop in engagement with the inside of said hoop said pretensioned wires having bends at the points of engagement with said hoop from which portions of the wires continuing straight from said bends towards said end face of the core are inclined from their points of engagement with said hoop radially outwardly relative to the axis of said core whereby said inclined wire portions provide stress systems reacting radially inwardly onto the adjacent concrete of the core and together with said stressed hoop exert restraint against flaring of the spigot end of the core which otherwise could be caused by said tensioned wire wrapping.

3,911,965
FIBER PREFORM AND METHOD AND APPARATUS FOR MAKING SAME

Arthur J. Wiltshire; Henry U. Ranallo, both of Cleveland, and Frank E. Czumber, Chardon, all of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Continuation of Ser. No. 158,385, June 30, 1971, abandoned. This application Mar. 16, 1973, Ser. No. 342,144
Int. Cl. F16l 9/12, 9/16
U.S. Cl. 138—178 7 Claims

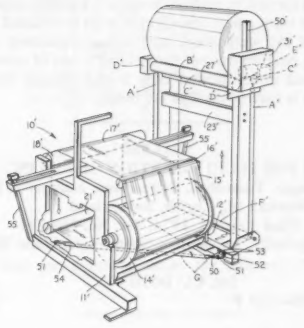


1. A tubular preform for fiber-reinforced plastic articles comprising a tubular wall portion having a length exceeding its diameter and an integral end wall portion closing one end of said tubular portion, the dominant orientation of the fibers of said tubular portion being in a spiral direction, said tubular and end wall portions being formed of a loose mat consisting of a large number of separate pieces of cut fiber randomly positioned in said wall portions, and a resin coating and interlocking the fibers in the wall portions including those fibers joining the tubular wall and the integral end wall without filling the voids therebetween, said preform being substantially uniform in density and free of seams and overlaps.

3,911,966
LOOM CLOTH ROLL TAKE UP

Robert W. Bond, 730 Cleveland St., Greenville, S.C. 29601, and William J. Alexander, III, Golden Strip Drive, Mauldin, S.C. 29662

Continuation-in-part of Ser. No. 353,237, April 23, 1973. This application May 16, 1974, Ser. No. 470,458
Int. Cl.² D03D 49/00, 49/20
U.S. Cl. 139—1 R 3 Claims



1. For use in a cloth roll take up for a loom having a loom warp beam adjacent the rear of the loom and a cloth delivery roll mounted to receive woven cloth carried between loom side frame members adjacent the front of the loom, said take up having means for guiding the cloth from said delivery roll and thence beneath toward the rear of the loom, the improvement comprising:

a guide bar positioned beneath and across the loom in a substantially horizontal plane at about a 45° angle to said loom side frame members, rearwardly of said means for guiding the cloth from said delivery roll, receiving the cloth from said means for guiding the cloth and directing same transversely beneath a loom side frame member; and

means positioned laterally of the loom adjacent a lower portion of an adjacent loom side frame member receiving the cloth from said guide bar and directing same to said cloth roll take up;

whereby said cloth roll take up may be positioned in a desired position remote from the upper forward portion of the loom.

3,911,967
LOOM WEFT POSITIONER

Harry L. Gainey, Hartsville, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

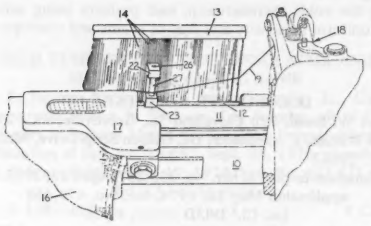
Filed June 11, 1974, Ser. No. 478,290
Int. Cl.² D03D 47/34
U.S. Cl. 139—116 4 Claims

1. In a loom of the shuttleless type wherein weft from a stationary source is inserted into sheds of warp threads from a location outside of the shed, the combination comprising:

a. a lay beam having a shed support fixed thereon;

b. a source of motive power operatively connected to said lay beam to effect oscillating movement thereof;

c. a reed including a plurality of reed dents mounted on said lay beam to effect beat-up of newly inserted weft yarn; and



d. means carried by said lay beam at a location adjacent the side of warp where insertion of weft is initiated and outside of the warp shed, said means contacting the weft during beat-up thereof for holding it out of contact with the reed dents located only in the vicinity where said means is carried on said lay beam.

3,911,968

DEVICES FOR FLUID INSERTION OF FILLING YARNS

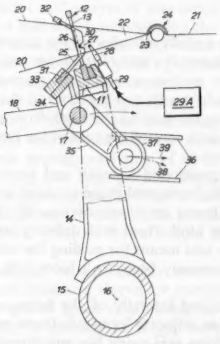
Hans Zollinger, Tann-Ruti, Switzerland, assignor to Ruti Machinery Works Ltd., Zurich, Switzerland

Filed June 17, 1974, Ser. No. 480,291

Claims priority, application Switzerland, June 20, 1973, 8938/73

Int. Cl.² D03D *47/30*

U.S. Cl. 139—127 P **7 Claims**



1. Loom having a device for the insertion of filling yarns by means of a fluid, having a reed mounted on and swinging back and forth with a lay for beating-up of the filling yarn, comprising a comb of parallel channel-forming blades defining a guide channel therein for fluid insertion of the filling yarn, the channel-forming blades extending fully through the warp threads at all times and each having a recess corresponding to the cross-section of the guide channel, each said recess having an outlet opening which faces the beating-up line of the filling yarns, each of the channel-forming blades engaging between teeth of the reed and being mounted on the lay swords and swingable therewith and controlled by a guiding means with respect to the movement of the reed in such a manner that upon the beating-up movement of the reed the channel-forming blades move a smaller distance towards the filling yarn beating-up point than the teeth of the reed, the latter moving at least up to the outlet openings of the channel-forming blades and pushing the filling yarn previously inserted into the guide channel before the beating-up of said yarn out of the guide channel.

3,911,969

STOP MOTION DEVICE FOR WEFT IN THE FORM OF A SINGLE THREAD OR SEVERAL THREADS

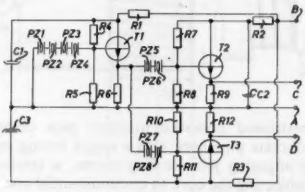
Sten Ake Olaus Rydborn, Kloxhultsvagen 21, 343 00 Almhult, Sweden

Filed Nov. 6, 1973, Ser. No. 413,308

Claims priority, application Sweden, Nov. 10, 1972, 14580/72

Int. Cl.² D03D *51/34*

U.S. Cl. 139—370 **4 Claims**



1. Weft stop motion device for interrupting the function of a loom upon rupture of one thread in a first weft formed of a plurality of threads or upon rupture of a thread of a second weft formed of a single thread, comprising a circuit having individual channel means for each of said threads, signal transmitter means in each of said individual channel means for converting the presence of said thread into an electric signal, said individual channel means for the single thread of said second weft being arranged to provide said electric signal in each of said individual channel means for each of the threads of said first weft.

3,911,970

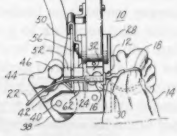
HAND OPERATED SEAL PRESS

George A. Lundberg, Pompton Lakes, and Carl Engesser, Nutley, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Filed Oct. 5, 1973, Ser. No. 403,969

Int. Cl.² B21F *9/02*

U.S. Cl. 140—93.4 **4 Claims**



1. A seal press for attaching a seal of the type having a seal body and a shackle for forming a tight loop about an article to be protected, said press comprising means for tightening said shackle around the article to be protected and through the seal body, means for deforming the seal body to maintain the shackle in the tightened condition, means for severing the shackle between the tightening means and the seal body, said severing means being actuated automatically at substantially the completion of the crimping of the seal body, and means for preventing release of the seal body deforming means until said

shackle severing means has been actuated to sever said shackle.

3,911,971

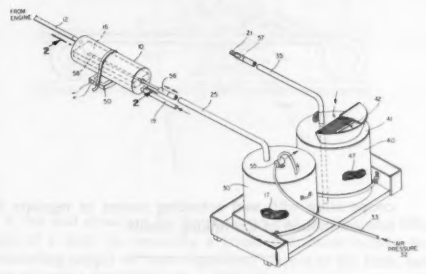
METHOD AND APPARATUS FOR EXCHANGING CATALYST IN A CATALYTIC CONVERTER

Harold R. Smithson, Westtown, and Jerry Allen Stirton, West Chester, both of Pa., assignors to Oxy-Catalyst, Incorporated, West Chester, Pa.

Continuation of Ser. No. 240,969, April 4, 1972, abandoned. This application Mar. 8, 1974, Ser. No. 449,456

Int. Cl.² B65B *1/04*

U.S. Cl. 141—1 **10 Claims**



2. A method of selectively depleting and replenishing with catalyst particles a catalytic exhaust purifier having a housing having an exhaust port and containing a catalyst bed area having a fill hole communicating therewith, said method comprising the steps of:

a. applying negative pressure to a particle-receiving container and through a first conduit extending from said receiving container to the fill hole of said bed area for extracting particles from the bed area and then transferring said first conduit and said negative pressure means from said fill hole to the exhaust port of said purifier and connecting the fill hole of said bed area through a second conduit to a container containing a supply of replacement particles for drawing said replacement particles from said supply container through said second conduit into said bed area, at least one of said first and second conduits being disposed in association with said bed area along a nongravitational flow path for said particles.

3,911,972

METHOD OF FILLING CONTAINERS ENCLOSING SOLID MATTER WITH AN ACCURATE AMOUNT OF LIQUID

Ernst Hubers, and Gerd-Jan Hubers, both of 4291 Suderwick No. 72, Germany

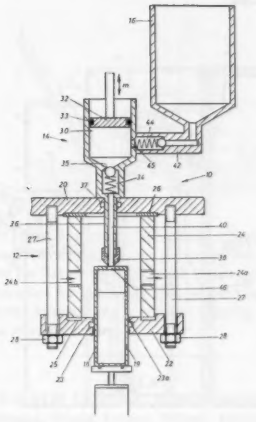
Filed May 18, 1972, Ser. No. 254,640

Claims priority, application Germany, May 27, 1971, 2126307

Int. Cl. B65b *3/04*, *31/02*

U.S. Cl. 141—7 **9 Claims**

1. A method of filling containers with an accurate amount of liquid inside an hermetically sealed chamber, said containers being entirely closed except for a filling opening in the upper portion of said container, and enclosing absorbent solid matter, said chamber including a container opening for sealingly engaging said container, said method comprising the steps of (a) placing said upper portion of said container into said chamber opening, then (b) producing an underpressure in said chamber, thereby evacuating the interior of said container, (c) accurately metering the amount of liquid required for filling said container, (d) bringing said filling opening into sealed engagement with the metered supply of liquid, and (e) feeding said metered amount of liquid through said filling opening into said container under the influence of an overpressure.



3,911,973

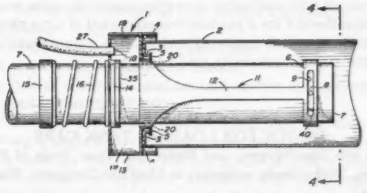
FUEL VAPOR SEAL DEVICE

Peter Casteline, Jr., Hamilton Square, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Jan. 18, 1974, Ser. No. 434,474

Int. Cl.² B65B *31/00*; B67C *3/34*

U.S. Cl. 141—59 **13 Claims**

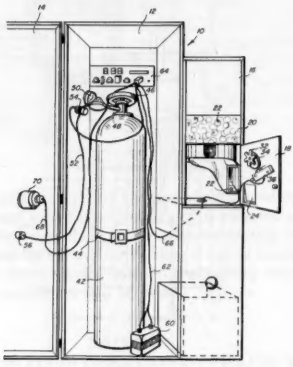


1. A fuel vapor seal and collection device for collecting fuel vapor from a fuel storage tank and channelling it to a reservoir, said device for use in combination with a fuel dispensing apparatus of the type having a delivery spout with an automatic vacuum shut-off aperture, said fuel vapor seal and collection device comprising a locking-ring assembly operable to make a vapor-tight seal to the exterior of a delivery spout of a dispensing apparatus while being movable relative to the spout, said locking-ring assembly having (a) conduit means for channeling the fuel vapor displaced from a full storage tank to a reservoir during filling operations, and (b) a projection mounted to the assembly and positioned adjacent to an vacuum shut-off aperture automatic in said spout cooperating to open and close said aperture when the device is moved relative to the spout.

3,911,974
BALLOON DISPENSING AND FILLING MACHINE

Claude W. Kuykendall, Charlotte, N.C., assignor to Merchandising Associates, Inc., Charlotte, N.C.

Filed May 16, 1974, Ser. No. 470,388
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—94 10 Claims



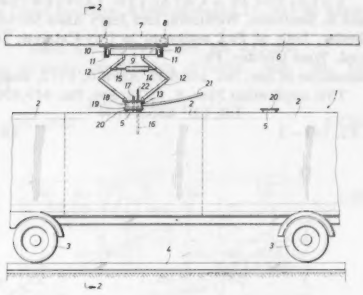
1. Apparatus for dispensing and filling balloons with gas including:
   a. a supply of balloons
   b. selectively operable means for serially dispensing individual balloons from said balloon supply;
   c. balloon filling means including a supply of gas, nozzle means connected to said gas supply and adapted to have a balloon fitted thereon for filling with said gas, and selectively operable valve means for controlling the flow of gas from said gas supply to said nozzle means; and
   d. control circuit means powered solely by a battery, and including electrical means for operating said valve means, a normally open manual switch, and circuit activating means operable in response to the operation of said dispensing means to automatically connect said battery in circuit with said valve operating means to cause energization thereof for a predetermined period of time when said manual switch is closed and to then automatically open the circuit containing said battery.

3,911,975
DEVICE FOR LOADING TANK CARS

Hans van Soestbergen, and Pieter van Toor, both of Rotterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 28, 1974, Ser. No. 455,829
Claims priority, application Netherlands, Apr. 4, 1973, 7304651
Int. Cl.[2] B65B *1/30*; B67C *3/02*
U.S. Cl. 141—95 4 Claims

1. An apparatus comprising a support;
carrier means for receiving and suspending a loading means;
alignment means connected to the support for aligning the carrier means horizontally over the inlet of a tank car to be loaded, the alignment means being connected to the carrier means through vertically expandable and contractable linking means;
actuating means for regulating the expansion and contraction of the linking means;
contacting means connected to the carrier means for achieving contact with the inlet of a tank car to be loaded, the contacting means including sensing means responsive to changes in contact pressure between the contacting means and a tank car being loaded, said sensing means

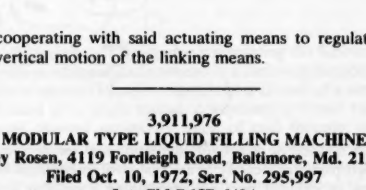


cooperating with said actuating means to regulate the vertical motion of the linking means.

3,911,976
MODULAR TYPE LIQUID FILLING MACHINE

Sidney Rosen, 4119 Fordleigh Road, Baltimore, Md. 21215

Filed Oct. 10, 1972, Ser. No. 295,997
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—84 7 Claims



1. A modular type system for filling a plurality of containers with fluid, comprising, at least two liquid filling machines, each machine having a single cycle operating mechanism, each machine having a plurality of fluid filling nozzles located in a filling area, operating means sequentially passing said containers into and out of said filling area in groups to be filled with fluid by said nozzles of said filling machines, electronic control means for synchronizing the operation of said filling machines, means connected to said synchronizing means for sensing containers in said filling area, power relays having contacts connectable with said single cycle operating mechanisms, means for closing and locking said connectable contacts of said power relays in an operative position to operate the single cycle operating mechanisms of the respective filling machines to fill said containers with fluid through the use of the respective nozzles of said filling machines, said synchronizing means being rendered operable in response to the sensing of the containers in said filling area by said sensing means, and means connected to the output of said synchronizing means and operable upon operation of said synchronizing means for actuating said closing and locking means to operate in synchronism said single cycle operating mechanisms of the respective filling machines.

3,911,977
FILLER PIPE END STRUCTURE, IN PARTICULAR FOR VEHICLE TANK

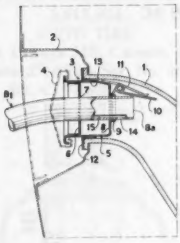
Jean-Marie Berger, Denney, France, assignor to Automobiles Peugeot and Regie Nationale des Usines Renault, both of Paris, France

Filed Sept. 12, 1974, Ser. No. 505,459

Claims priority, application France, Sept. 14, 1973, 73.33037

Int. Cl.² B65D *29/02*

U.S. Cl. 141—348 **5 Claims**



1. An end structure for fixing to an end portion of a filler pipe of a tank for receiving a liquid distributor nozzle and precluding supply of "non-regulation" liquid to the tank, said end structure comprising in combination:

a tubular member having a flanged entrance end adapted to receive a filler cap, an imperforate wall, and a first transverse wall defining a constricted passage in the tubular member remote from said entrance end,

a valve member operative to close and open said constricted passage,

yieldable means for yieldably biasing said valve member to a passage-closing position of the valve member, and

a second transverse wall disposed in said tubular member adjacent said entrance end and defining a second passage, the two transverse walls and said tubular member defining a chamber of relatively small volume and

said constricted passage having a first predetermined size slightly larger than the exterior of a "regulation" liquid distributor nozzle and capable of allowing the passage through the first wall of a "regulation" liquid distributor nozzle with a small clearance between the nozzle and the constricted passage while precluding the passage therethrough of a "non-regulation" liquid distributor nozzle and said second passage having a second predetermined size, larger than the first predetermined size, slightly larger than the exterior of a "non-regulation" liquid distributor nozzle, and capable of allowing the passage through the second wall of a "non-regulation" liquid distributor nozzle with a small clearance between the nozzle and the second passage,

said valve member biasing means being capable of holding the valve member in its constricted passage closing position against the pressure of said liquid and allowing the valve member to move to its constricted passage opening position upon exertion of a thrust on the valve member by the "regulation" liquid distributor nozzle.

3,911,978
MEANS FOR FASTENING WOOD VENEER SHEETS IN EDGE-TO-EDGE RELATIONSHIP

Autry E. Hurst, 1812 E. Austin, Nacogdoches, Tex. 75961

Filed June 3, 1974, Ser. No. 475,855

Int. Cl. B27c *9/00*

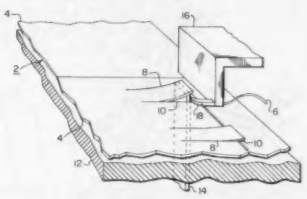
U.S. Cl. 144—2 R **8 Claims**

1. Means for fastening together substantially rectangular wooden veneer sheets in contiguous edge-to-edge relationship including

means for supporting a plurality of sheets in abutting edge-to-edge engagement,

punch means for forming at least one integral fluke-like tooth in each sheet,

each tooth projecting from its sheet at an angle sufficient to provide a recess therebeneath,



means for threading string-like means through each recess so as to connect contiguous sheets to one another,

and means for flattening each tooth so as to close the underlying recesses for confining spaced portions of the string-like means beneath the teeth and thereby provide a continuous composite strip.

3,911,979
DEVICE FOR CUTTING DOWN TREE STEMS

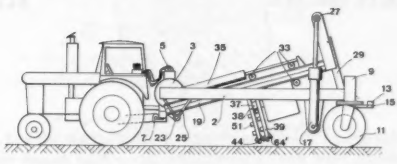
Joseph Rousseau, 40-44 Avenue Wissel, 69250 Neuville-sur-Saone, France

Filed May 13, 1974, Ser. No. 469,538

Claims priority, application France, May 22, 1973, 73.19580

Int. Cl.² B02C *1/04;* **A01G** *23/08*

U.S. Cl. 144—2 N **14 Claims**



1. A device for cutting out tree stumps comprising:

a. a frame

b. a chassis mounted within said frame

c. a carrier mounted on said chassis

d. a pair of discs mounted on said carrier and rotatable in opposite directions; and

e. forwardly projecting cutters distributed on each disc along a single line, each line respectively defining a spiral the lines for each disc, starting at the periphery, forming two pitches of opposite direction and complimentary disposition; the cutters on each disc being symmetrically disposed so as to converge during rotation of the discs thereby being capable of simultaneously cutting into the stump, the directions of rotation of the discs drawing the machine toward the ground.

3,911,980
TREE HARVESTING MACHINE OF A WALKING TYPE

Bruce J. McColl, Whitby, Canada, assignor to Owens-Illinois, Inc., Toledo, Ohio

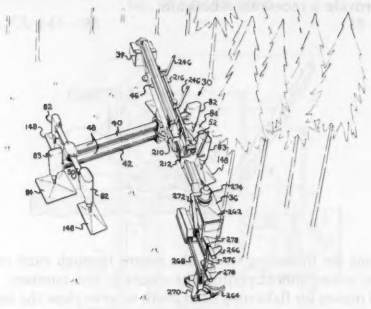
Continuation-in-part of Ser. No. 216,412, Jan. 10, 1972, Pat. No. 3,804,137. This application Dec. 14, 1973, Ser. No. 425,056

Int. Cl.² A01G *23/08*

U.S. Cl. 144—3 D **16 Claims**

1. A tree-harvesting apparatus comprising in combination: a self-propelled vehicle; a boom assembly having a generally

horizontally disposed elongated boom member; a tree-harvesting means on said boom, said harvesting means including a means for grasping and severing a tree trunk from its stump; a tree-processing means on said beam; and carriage means for



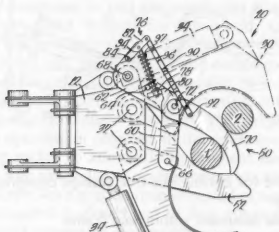
directly mounting said boom assembly on said vehicle such that said boom assembly is rotatable about a generally vertical axis and said vertical axis is in a fixed position relative to said carriage and is translationally movable with respect to said vehicle.

3,911,981

TREE HARVESTING APPARATUS

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 29, 1974, Ser. No. 518,507
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 R **3 Claims**



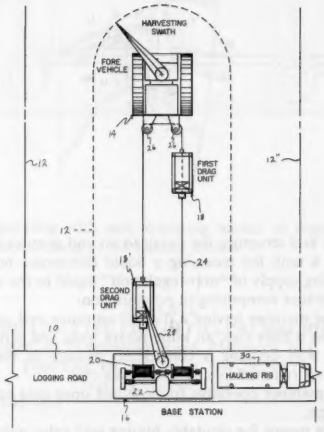
1. Tree harvesting apparatus for use at the end of a boom movably supported on a vehicle comprising elongated rigid support means, grapple means pivotally supported on said support means for grasping and securely holding a standing tree, said grapple means including at least one arm pivoted about a fixed pivot on said support means, tree cutting means adjacent one end of said support means for severing a tree while being grasped by said grapple means, and tree accumulator means for accumulating a plurality of trees on said support means, the improvement of said tree accumulator means including a fixed tree engaging element on said support means, compound linkage means consisting of first and second pivotally interconnected links, said first link having one end pivoted on said rigid support means, said second link having one end pivoted on said at least one arm at a location spaced from said fixed pivot, a third link pivoted on one of said first and second links, and biasing means between said third link and said one of said first and second links, said biasing means normally maintaining said third link in a first position relative to said one of said first and second links and pivotal movement of said at least one arm will change the position of said links and move said third link between open and clamped positions relative to said fixed tree engaging element.

3,911,982

CABLE LOGGING SYSTEM AND OPERATING METHOD

Evander M. Ervin, and Ervin E. Dargan, both of c/o Roundwood Corporation of America, P.O. Box 826, Florence, S.C. 29501

Filed May 28, 1974, Ser. No. 473,807
Int. Cl.² B27M *1/08;* **B27C** *9/00;* **E27C** *29/16*
U.S. Cl. 144—309 AC **10 Claims**



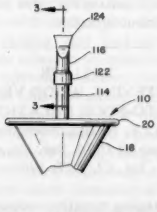
1. A cable logging system comprising a self-propelled fore vehicle, a base station, a felled tree drag unit, cable extending from said base station to said fore vehicle with said drag unit associated intermediately therewith, means operable at said force vehicle for loading said drag unit with felled trees, first means carried by said drag unit for grasping trees loaded thereon, second means carried by said drag unit for selectively rendering the same fast or loose on said cable, and means for paying out and drawing in said cable as said fore vehicle moves away from or returns toward said base station and as a drag unit is to be moved to said fore vehicle for loading or brought to said base station when loaded.

3,911,983

AIRPLANE SUMP DRAIN APPARATUS

Ronnie D. Wyatt, 3408 Thomas, Midland, Tex. 79701

Filed May 2, 1974, Ser. No. 466,486
Int. Cl.² B25B *15/00, 13/48*
U.S. Cl. 145—50 A **7 Claims**



1. Aircraft sump drain tool comprising an upwardly opening cup member for containing fuel therein;

a handle underlying and supporting said cup member; means by which the cup member is rigidly affixed to the handle;

an upwardly extending member, said upwardly extending member being affixed to said cup and having a gas cock engaging means attached to the free end portion thereof so that said gas cock engaging means can move a gas cock of an airplane sump to the open position while fuel flows therefrom and into said cup;

said gas cock engaging means being in the form of a screwdriver.

3,911,984

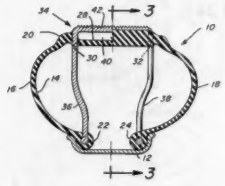
SNOW TIRE

Allen D. West, P.O. Drawer 310, Catoosa, Okla. 74015

Filed June 27, 1974, Ser. No. 483,558

Int. Cl.² B60C *11/14*

U.S. Cl. 152—208 **3 Claims**



1. A snow tire comprising a casing mountable on a wheel rim and having tread portion on the outer surface of said casing, a plurality of spaced elongated recesses provided in said tread portion, a pair of oppositely disposed spaced apertures provided in each end of said recess and extending through the casing to the interior of the tire, a pair of oppositely disposed radially extending steel roads for each said recess, each said steel rod having one end thereof secured to the casing adjacent to the wheel rim and the other end of said rod extending through each of the apertures in communication with each recess, sealing means for providing an airtight seal between the tire casing and the outer end of said rods, elongated steel cross bar secured between the outer ends of the rods and radially reciprocally disposed within said recess, steel teeth provided along the outer edge of said cross bar whereby when the tire is fully inflated, the outer surface of the tread will extend outwardly beyond the steel teeth thereby causing said teeth to be recessed within the elongated recess and upon partial deflation of the tire, said teeth will protrude beyond the outer surface of the tread.

3,911,985

SURFACE GRIPPING PRONG DEVICE

Kemper H. Fletcher, Kingsport, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 19, 1974, Ser. No. 525,162

Int. Cl.² B60C *27/02*

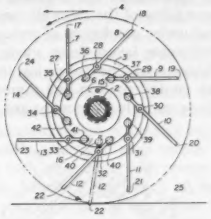
U.S. Cl. 152—208 **2 Claims**

1. A surface gripping prong device for a vehicle having an axle, a wheel affixed to and rotatable with the axle, a tire mounted on the wheel and a passenger compartment, said surface gripping prong device comprising

a disc-type member substantially coaxially positioned around the axle of a vehicle in proximity with a wheel thereof affixed to the axle;

a plurality of rod-like surface gripping prongs substantially equiangularly pivotally affixed to the wheel and slidably mounted on the disc-type member; and

control means coupled to the disc-type member for selectively rotating the disc-type member around the axle in a manner whereby the prongs are selectively positioned with their ends farthest from the axle within the diameter of a tire on the wheel whereby the prongs are free from



contact with a surface supporting the tire and with their ends farthest from the axle extending beyond the diameter of said tire whereby the prongs grip said surface.

3,911,986

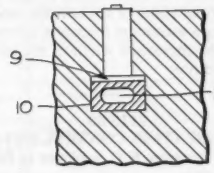
ANTI-SKID ELEMENT FOR A VEHICLE TIRE

Rudolf Cantz, Stuttgart, Germany, assignor to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 303,316, Nov. 3, 1972, Pat. No. 3,831,665. This application July 2, 1974, Ser. No. 465,253

Int. Cl.² B60C *27/00*

U.S. Cl. 152—210 **3 Claims**



1. In a tire stud; a member comprising a shank having radial flange means at one end and having a hard wear resistant element mounted on the axis thereof at the other end, and a body of material more resilient than tire tread material engaging the side of said flange means which faces away from said shank, said body of material being coextensive with said flange means in the lateral direction, said body comprising at least one cavity therein to modify the resilience of said body in the axial direction, and means adhesively connecting said body of resilient material to said flange means.

3,911,987

PNEUMATIC SAFETY TIRE FOR MOTORCYCLES

Takashi Takusagawa, Ohme, and Akira Fujikawa, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 6, 1973, Ser. No. 413,305

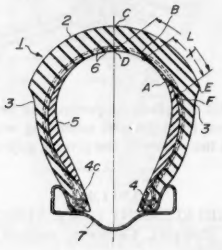
Claims priority, application Japan, Nov. 13, 1972, 47-112869

Int. Cl.² B60C *9/02, 13/00, 17/00*

U.S. Cl. 152—354 **11 Claims**

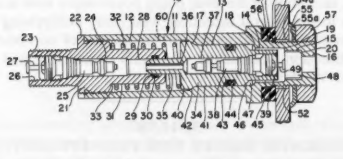
1. A pneumatic safety tire for motorcycles, comprising: a pair of axially spaced annular beads, a toroidal carcass extending across the beads and forming a pair of sidewalls connected by a carcass crown portion, a tire tread secured onto the outer surface of the carcass at said crown portion, said tire tread having a width sufficiently wide to provide a thorough contact area with the ground even when the tire is tilted at a camber angle when cornering and having a substantially uniform thickness along the outer peripheral surface of said carcass, a pair of sidewall rubbers secured to the carcass and extending

from the beads to the side edges of the tire tread, and a pair of elastic reinforcing layers continuously extending along the inner surface of the carcass in a complementary fashion to said sidewalls to supplement the thickness of said sidewalls and enhance the rigidity of the sidewalls and their ability for supporting a load under conditions of reduced tire pressure, each of said reinforcing layers being made of a rubber-like material with a Shore A hardness of no less than 45 and having a relatively thick central portion and thinned edge portions which become progressively thinner toward the ends thereof,



said reinforcing layer extending toward the equatorial plane of the tire beyond the point of alignment with the side edge of the tire tread with the distance X from the alignment point to the termination point of the reinforcing layer with said carcass in the direction of the equatorial plane of the tire being not smaller than 20 percent of the distance L from the alignment point to the equatorial plane of the carcass, said elastic reinforcing layer having a maximum thickness corresponding to 3 to 15 percent of the maximum width of the toroidal carcass under inflated condition.

3,911,988
PRESSURIZATION CONTROL DEVICE
Don Lee Richards, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio
Filed Feb. 21, 1974, Ser. No. 444,604
Int. Cl. F16K *15/70*
U.S. Cl. 152—427 **11 Claims**



1. A pressurization control device for the pressurization of a container to a predetermined maximum pressure, said device comprising:

a housing having an axial bore therethrough, said housing having mounting means at one end thereof for sealingly mounting said housing to said container with said bore of said housing being in fluid communication with interior of said container, the other end of said housing having means to receive a source of pressurized fluid;

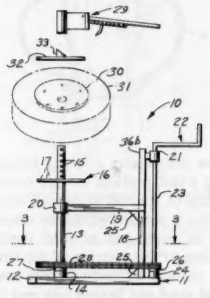
a first normally closed valve operatively connected to said other end of said housing, said normally closed valve permitting pressurized fluid to enter said bore of said housing when said valve is opened;

a piston having an axial bore therethrough slidably received in said housing bore intermediate said first normally closed valve and said one end of said housing, said piston having a face acted upon by pressure within said container to bias said piston towards said first normally closed valve;

a second normally closed valve mounted to said piston for axial movement therewith and for controlling the flow of fluid through said axial piston bore, said second normally closed valve opening when said piston is axially adjacent said one end of said housing, and

biasing means for urging said piston towards said one end of said housing, said predetermined maximum pressure acting upon said piston face being effective to overcome said biasing means to move said piston towards said first normally closed valve thereby allowing said second normally closed valve to close preventing further pressurization of said container.

3,911,989
TIRE CHANGER
William Vandenburg, Lark, N. Dak. 58550
Filed July 24, 1974, Ser. No. 491,466
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.24 **2 Claims**



1. A tire changer which comprises a base member, a crank having an upright axis rotatably mounted on the base member, a pipe member rotatably mounted on the base member spaced from and parallel to the axis of the crank, bearing means carried by said base member and rotatably supporting the crank and the pipe member, sprocket means carried by the crank and by the pipe member, chain means running on the sprocket means so that turning of the crank means turns the pipe member, a turn table plate mounted on the pipe member for supporting a wheel and a tire mounted on the wheel to turn therewith, a bead breaking member removably mountable on the pipe member overlying the turn table plate and engageable with the tire to break a bead of the tire from a rim of the wheel, a tire hold-down member removably mountable on the pipe member to hold the wheel on the turn table plate, and a mounting and removing tool engageable with the bead of the tire as the crank is turned to turn the pipe member and the wheel to advance the bead over the rim of the wheel.

3,911,990
WINDOW AND SCREEN COMBINATION
D. Eugene Hoover; Kenneth T. Morris, both of 247 Paradise Cove, 28128 Paradise Coast Highway, and John A. Sheafor, 255 Paradise Cove, 28128 Pacific Coast Highway, all of Malibu, Calif. 90263
Filed Sept. 27, 1973, Ser. No. 401,423
Int. Cl.² E06B *9/08*
U.S. Cl. 160—100 **5 Claims**

1. A slidable window and screen combination mountable in a window frame and comprising:

a window sash within which the slidable window is adapted to move;

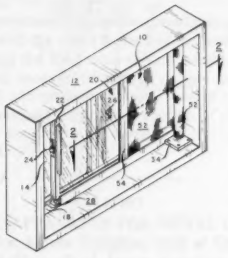
said sash including a pair of flange members extending inward and generally toward one another on opposite sides of said sash;

a plurality of windows mounted in said sash, one of said windows being fixed and one being slidable to open and closed positions and having an edge contacting and closing against said window sash;

a roller mounted internally of said windows with its primary axis in parallel relation to said window edge;

a screen upon said roller, attachable to said window edge and adapted to be dispensed from and rewound upon said roller responsive to movement of said window;

spring means connected to said roller to cause its rotation for controlling the dispensing of and for retracting said screen;



interengaging generally U-shaped bracket means upon said slidable window and said screen and adapted for disengagement for removing said screen from said slidable window;

slot means in each said flange adjacent said roller, said roller being positioned on one side of said flange with said screen leading from said roller, through said slot means and into said attachment to said window;

said flange on at least one side of said slot means being curved to facilitate a smooth, chafe-free movement of said screen through said slot means; and

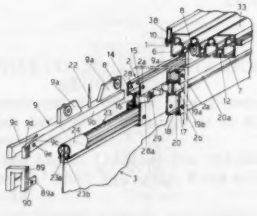
said screen, after passing from said roller through said slot, being positioned in firm contact with one surface of said flange, tension being maintained upon said screen by said spring means, thereby maintaining such contact.

3,911,991

CURTAIN FORMED OF SLIDING SHEETS OF CLOTH OR THE LIKE

Corrado Malferrari, Rioveggio-Bologna, Italy, assignor to Modular S.p.A., Bologna, Italy

Filed Jan. 14, 1974, Ser. No. 433,136
Claims priority, application Italy, Nov. 14, 1973, 53685/73
Int. Cl.[2] E05D *15/08*
U.S. Cl. 160—202 **9 Claims**



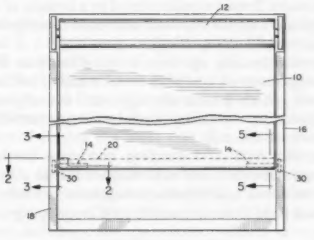
1. A movable curtain assembly having overhead track means and having end track means adapted to receive in elongated openings the end edges of non-rigid panels forming said movable curtain, comprising: each of said overhead track means having a downwardly directed opening or passageway and laterally projecting flange means adjacent said passageway; carrier means suspended in a releasable manner to sliding means having at least a pair of roller means adapted to be tranversible in said track means; said carrier means having a downwardly facing elongated opening adapted to removably receive fastening means which releasably secure the upper edge of said panels to said carrier means; said panels comprising non-rigid materials; means releasably engaging the lower edge of said panel; adjustable stop means on said carrier means coacting with adjustable stop means of an adjacent carrier means for adjusting the length of the two proposed portions of the vertical edges of the panels in the extended condition of the panel or curtain assembly; and means for precluding the lower edges of the panels from separating with respect to each other, whereby said panels can be readily removed from said curtain assembly for cleaning.

3,911,992

SHADE POSITION LATCH DEVICE

Tony Fulton Webb, El Cajon, Calif., assignor to Webb Textiles, Inc., El Cajon, Calif.

Filed Mar. 26, 1974, Ser. No. 454,858
Int. Cl.[2] A47G *5/02*
U.S. Cl. 160—290 **7 Claims**



1. A device for use on shades carried on a spring loaded shade roller and guided at the shade bottom edge in opposed generally U-shaped channels, including at least one stop element extending from a wall of said channel into said channel, and wherein the improvement comprises:

latch means comprising a latch unit carried on said shade and having a latch pawl for selective engagement with said stop elements to hold said shade at preselected levels,

said latch pawl is received in said channels and has a major dimension greater than the unobstructed width of said channel,

said latch unit includes a spring barrel housing resilient means,

said resilient means for torsionally biasing the upper portion of said latch pawl into engagement with the wall of said channel mounting said stop elements and for biasing said latch pawl axially outwardly,

said resilient means comprising a single helical spring secured at one end to said barrel and at the opposite end to a shaft connected to said latch pawl to form a combined compression and torsion spring means for providing axial resiliency as well as torsional resiliency,

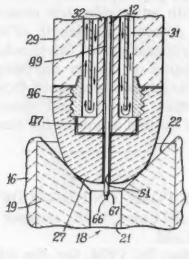
whereby said pawl is biased axially into engagement with said channel and torsionally into engagement with said stop element until said shade is moved transversely of said channel to cause said pawl to be cammed out of engagement with said stop member and to permit said spring loaded shade roller to draw said shade upwardly.

3,911,993

METHOD AND APPARATUS FOR ADDING TREATING AGENTS TO MOLTEN METAL

Maurice L. Caudill, Peoria, Ill.; Steven C. Cochran, Louisville, Ky., and Donald C. Loebach, East Peoria, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed July 12, 1974, Ser. No. 487,934
Int. Cl.² B22D 27/20
U.S. Cl. 164—55 12 Claims



1. A method of adding a treating agent to a molten metal stream provided from a nozzle carried in a bottom of a molten metal filled ladle or the like and delivered directly from said nozzle into a mold, comprising:

feeding said treating agent in a wire-like form through a central passage of a tubular metal member within a stopper rod which passes through said molten metal and provides access to said molten stream substantially within the said nozzle; and

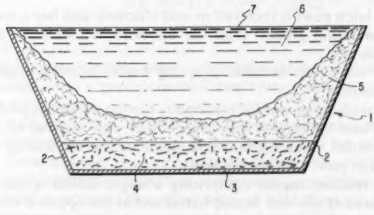
concurrently with said feeding, passing a coolant fluid through the interior of said stopper rod in contact with the exterior of said tubular metal member while preventing said fluid from contacting said treating agent.

3,911,994

UTILIZATION OF SILICON FINES IN CASTING

Delbert A. Truman, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed Nov. 8, 1974, Ser. No. 522,112
Int. Cl.² B22D 3/00
U.S. Cl. 164—72 5 Claims



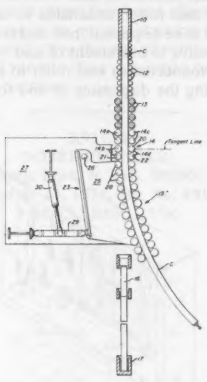
1. In the art of casting molten silicon in a mold to form an ingot and thereafter crushing the ingot to obtain lumps of silicon, wherein said crushing also produces more finely divided silicon, the method which comprises lining the mold with a layer of the finely divided silicon from previous crushing operations and casting the molten metal in contact with said layer.

3,911,995

METHOD AND APPARATUS FOR USING A RIGID STARTER BAR THROUGH A FIXED BENDING UNIT

Quin Shen Yu, Forest Hills Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1971, Ser. No. 185,644
Int. Cl.² B22D 11/08
U.S. Cl. 164—82 6 Claims



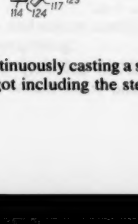
1. In a continuous-casting machine, which includes a mold, a guide-roll rack below said mold, an assembly of power-driven pinch rolls below said guide-roll rack, a set of bending rolls below said pinch rolls, a curved roll rack below said bending rolls, and a rigid starter bar adapted to be disconnected from a casting after the leading end of the casting passes said pinch rolls, said bending rolls including a fulcrum roll which defines a tangent line where the casting first acquires a curvature and other rolls which contact the convex and concave faces of the casting both above and below said tangent line, the improvement comprising a switch section in which several rolls of the curved roll rack are journaled, said switch section being shiftable to an open position to allow said starter bar to pass vertically and to a closed position to guide the casting into the rolls below, said bending rolls below said tangent line having work-engaging faces offset horizontally from the work-engaging faces of the rolls above in the direction toward which the casting curves, but being journaled on fixed axes.

3,911,996

APPARATUS FOR CONTINUOUS CASTING OF METALS

Renald Veillette, Jonquiere, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 30, 1974, Ser. No. 465,554
Claims priority, application United Kingdom, Apr. 30, 1973, 20553/73
Int. Cl. B22d 11/02
U.S. Cl. 164—82 10 Claims



1. Procedure for continuously casting a substantially rectangular-section metal ingot including the steps of

a. supplying molten metal to the inlet end of a mould having an open outlet end and a substantially rectangular passage therethrough and maintaining a head of molten metal in said mould during said casting operation,
b. cooling the mould for solidifying the peripheral portion of the metal therein,
c. advancing the ingot through the mould at a relatively low initial speed and then increasing the rate of advance of the ingot through the mould,
d. applying coolant directly to the surface of the ingot emerging from said mould, and
e. increasing the gap at least between the mid-points of the opposed longer sides of the rectangular mould without substantial alteration of the gap between said sides at the ends thereof when the rate of advance of the ingot through the mould is increased above the relatively low initial speed,

wherein the improvement comprises maintaining a water filled zone in contact with the outer surface of the wall of the mould, and, at least along the long sides of said mould, directing jets of water into said water filled zone at closely spaced intervals towards said wall and towards the outlet end of said mould and emitting a substantially continuous curtain of water from the said water filled zone onto the surface of the ingot emerging from said mould.

3,911,997

MAGNETIC APPARATUS FOR METAL CASTING

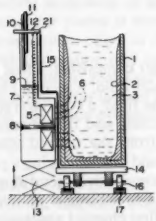
Kiyoshi Sugazawa; Kiyoto Ushijima, both of Kobe, and Kantaro Sasaki, Ashiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Sumitomo Shipbuilding and Machinery Co., Ltd., Japan

Filed Dec. 19, 1973, Ser. No. 425,951

Claims priority, application Japan, Dec. 20, 1972, 47-128555

Int. Cl.² B22D *27/02*

U.S. Cl. 164—147 **12 Claims**



1. An apparatus for casting metals comprising means for holding non-solidified metal, means for generating a heterogenious magneto-static field in said non-solidified metal, said generating means being disposed in the vicinity of one side of said holding means, and means for causing relative movement of said holding means and generating means to each other.

3,911,998

PROTECTIVE COATING FOR BETA-SPODUMENE REGENERATORS

Joseph J. Domicone, Horseheads, and Charles J. Parker, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,566

Int. Cl.² B05D *3/02, 1/18;* **B32B** *9/04*

U.S. Cl. 165—10 **3 Claims**

1. A beta-spodumene ceramic gas turbine regenerator wheel demonstrating improved resistance to attack by exhaust gases containing sulfur oxides and water vapor at temperatures in the range of about 400°-650°F. having on at least a portion thereof a protective coating consisting essentially of a cured silicone selected from the group consisting of silicone fluids and silicone resins.

3,911,999

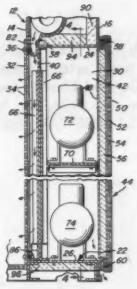
RADIANT AND CONVECTION HEATED CHAMBERS

John A. Iller, Seattle, Wash., assignor to Adabelle E. Iller, Seattle, Wash., a part interest

Filed Oct. 25, 1973, Ser. No. 409,675

Int. Cl. B60h *1/00*

U.S. Cl. 165—41 **10 Claims**



1. In combination, a heat insulative enclosure adapted to be inhabited in a frigid zone and to be at least somewhat heated interiorly, at least by its inhabitants, said enclosure having a first wall including means defining an opening extending therethrough and forming a chamber between the opposite inner and outer surfaces of said wall, a panel of heat conductive material closing the inner end of said chamber adjacent the inner surface of said wall, a heat insulative closure member movable into and out of position adjacent the outer surface of said wall closing the outer end of said chamber, said chamber, inwardly of said closure member and outwardly of said panel, defining a storage area in which to store an assemblage which may be adversely affected by extreme cold temperatures, said enclosure including means, operative at least when the temperature of air within said storage area is lower than the temperature of said panel and the air within said enclosure, operative to cause air from within said enclosure to flow across the inner surface of said panel for transmitting heat energy from the air within said enclosure to said panel and from the latter to the air within said storage area and thus to said assemblage.

3,912,000

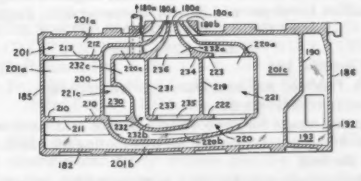
MULTI-COOLING HOUSING FOR A MULTI-STAGE COMPRESSING SYSTEM

Zoltan P. Nyeste, Grand Island, N.Y., assignor to Worthington-Cei Incorporated, West Springfield, Mass.

Division of Ser. No. 245,578, April 19, 1972, Pat. No. 3,802,795. This application Jan. 11, 1974, Ser. No. 432,658

Int. Cl.² F24H *3/00*

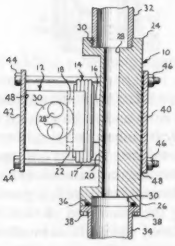
U.S. Cl. 165—47 **12 Claims**



1. In a multi-cooler for compressed air or gas,

a. a heat exchange housing comprising, a box-like member having a plurality of inlets and outlets for passing compressed air or gas into and out of the heat exchange housing,
b. said box-like member having a plurality of heat exchange loops and at least one exchange means in each of said heat exchange loops,
c. each of said plurality of heat exchange loops communicating with one of the inlets at one end and one of the outlets at the opposite,
d. said plurality of heat exchange loops disposed substantially one within the other.

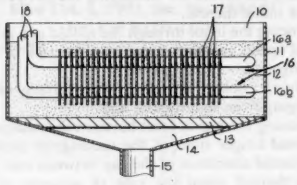
3,912,001
WATER COOLED HEAT SINK ASSEMBLY
Robert C. Missman, and Carter Sinclair, both of Waynesboro, Va., assignors to General Electric Company, Salem, Va.
Filed Mar. 11, 1974, Ser. No. 449,742
Int. Cl.² F28F 7/00; H02B 1/00
U.S. Cl. 165—80 **13 Claims**



1. A fluid cooled heat sink assembly for use with a heat source comprising:
a. at least two members, of a material exhibiting good thermal conductivity, adapted to retain the heat source therebetween, each of said members having,
1. at least one conduit extending substantially parallel to a major axis thereof for the passage of a cooling fluid therethrough, and
2. a central portion of reduced cross-sectional area with respect to each of two end portions, said central portion defining a contact surface for the heat source;
b. said members being positioned such that corresponding major axes of respective members are disposed in a skew line relationship; and,
c. retaining means for securing said assembly.

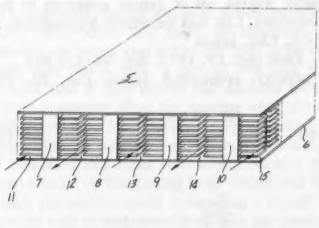
3,912,002
HEAT EXCHANGER
Douglas Ernest Elliott, Sutton Coldfield, England, assignor to Fluidfire Development Limited, Worcestershire, England
Filed Oct. 13, 1972, Ser. No. 297,368
Int. Cl. F28d 13/00
U.S. Cl. 165—104 **18 Claims**

1. A. fluidized bed heat exchanger comprising:
a quantity of solid particles,
distributor means for supporting a bed of said particles, for admitting a gas thereto and for distributing the gas throughout the bed,
and at least one tube having a portion defining an extended heat transfer surface, said portion being immersed in the particles,
wherein the depth of the bed measured from a surface of the



bed in contact with the distributor means to an opposite surface, is not greater than 6 inches.

3,912,003
HEAT EXCHANGER
Jean Schrade, Ottenberg Str. 8, Zurich, Switzerland
Filed Apr. 10, 1974, Ser. No. 459,468
Claims priority, application Switzerland, Apr. 13, 1973, 5290/73
Int. Cl.² F28F 3/08
U.S. Cl. 165—165 **10 Claims**

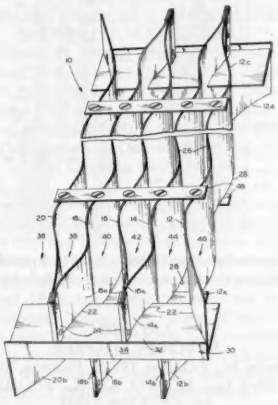


1. A heat exchanger comprising: a first channel for conveying a first heat transfer fluid; a second channel for conveying a second heat transfer fluid; a corrosion resistant solid, impervious member separating said first channel and the first fluid circulating therein from the second channel and the fluid circulating therein, said member being a poor heat conductor; a plurality of heat conductive metal fins extending through said member, with a first portion of said fins only partially extending into said first channel and a second portion of said fins only partially extending into said second channel so that the second fluid circulating in the second channel is in heat exchange relationship with the first fluid circulating in the first channel due to heat being conducted substantially only by said fins, said fins being sealed in said member so that there is no fluid leakage through said member.

3,912,004
HEAT EXCHANGER APPARATUS WITH SPACER PROJECTIONS BETWEEN PLATES
William J. Darm, 5815 SW. Tucker Ave., Beaverton, Oreg. 97005
Continuation-in-part of Ser. No. 468,659, May 10, 1974, which is a continuation of Ser. No. 221,543, Jan. 28, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,170
Int. Cl.² F28F 3/10
U.S. Cl. 165—166 **11 Claims**

1. A counterflow heat exchanger apparatus comprising:
a plurality of heat exchanger plates defining a plurality of fluiid channels disposed side by side between said plates, said plates having longitudinal edges extending between the opposite ends thereof;

a plurality of fastening means for joining the opposite ends of the exchanger plates to the ends of other exchanger plates adjacent thereto, at least some of said plates having each of their ends split into two end portions which are joined to two different exchanger plates on opposite sides thereof and separated by a divider member extending laterally to said end portions to form two separate sets of channels both of whose inlet and outlet openings are defined by said split end portions and said divider member, said two sets of channels both extending in substantially the same direction, so that fluid can flow through one set in the opposite direction to

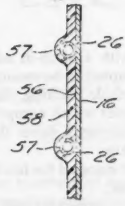


fluid flowing through the other set of channels to provide a counterflow heat exchanger;

sealing means attached to the longitudinal edges of said plates for sealing said channels; and

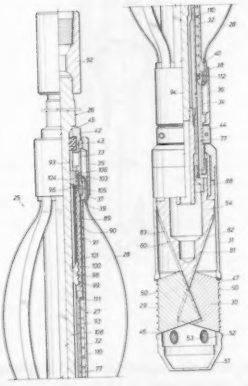
spacer means for spacing the exchanger plates apart, said spacer means including a plurality of separate spacer projections on the exchanger plates at intermediate positions between the two longitudinal edges of the plates, said projections on one plate extending into contact with at least one other exchanger plate so that said one plate contacts the two plates on opposite sides thereof to form each of said two sets of channels with fixed predetermined widths.

3,912,005
LINER ASSEMBLY
Leslie N. Griffiths, Tarvin, England, assignor to Kelvinator, Inc., Grand Rapids, Mich.
Division of Ser. No. 203,590, Dec. 1, 1971, Pat. No. 3,799,831. This application Nov. 23, 1973, Ser. No. 418,244
Int. Cl.² F28F *13/18, 19/02*
U.S. Cl. 165—169 **5 Claims**



1. A heat exchanger wall assembly in a refrigerator apparatus comprising a plurality of substantially flat walls being fabricated from sheet stock into a boxlike inner liner and each having a generally rectangular shape, a plurality of substantially planar parallel interconnected metal tube portions covering a plurality of said walls, said tube portions having a length substantially equal to the distance from one edge of an associated wall to an opposite wall edge, each of said tube portions being in heat conducting engagement and in direct contact with a side of its associated wall along substantially its full length, a non-metallic organic coating covering substantially all of the surface of each wall side not engaged by said tubing and at least a substantial portion of the outer surface of each tube portion not engaging said wall, said coating adhering to said wall side and providing the sole means for maintaining said tube portions in heat conducting engagement with said wall substantially along their full length.

3,912,006
SIDEWALL ANCHOR APPARATUS
Benjamin P. Nutter, Bellville, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed July 17, 1974, Ser. No. 489,345
Int. Cl.² E21B *23/00*
U.S. Cl. 166—216 **8 Claims**



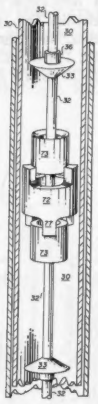
1. Apparatus adapted for anchoring a well tool against longitudinal movement in a borehole, comprising: a tubular housing having a longitudinal axis; oppositely disposed slip members mounted on said housing for lateral movement between mutually retracted and extended positions, one of said slip members having recess means in a rear portion thereof arranged and adapted to receive a rear portion of the other of said slip members in said retracted position whereby said portions of said slip members can overlap one another and extend beyond the longitudinal axis of said housing in said retracted position; and expander means movable longitudinally of said housing and said slip members and having inclined surfaces cooperable with companion inclined inner surfaces on said slip members for shifting said slip members from retracted to extended positions in response to movement of said expander means relative to said housing in one longitudinal direction.

3,912,007
FREELY SLIDABLE PARAFFIN SCRAPING AND REMOVING TOOL FOR CLEANING OIL WELL TUBING
Terrell B. Hellums, Rte. 2, Box 180 A, and Jess Sanford Hellums, Jr., 620 Frio, both of Lockhart, Tex. 78644
Filed Dec. 17, 1973, Ser. No. 425,295
Int. Cl.² E21B *37/02*
U.S. Cl. 166—175 **3 Claims**

3. A double-ended freely slidable paraffin scraping and removing tool for continuing maintenance of the interior surfaces of oil well tubing, comprising, in combination:

a. ring means including a tubular ring having two spaced ends for cutting and shaping paraffin, and arranged for frictionally engaging and scraping interior walls of standard oil well tubing while being spaced from a sucker rod disposed within the tubing, the spacing between the ring means and sucker rod permitting oil and dislodged paraffin particles to pass through the ring even when the sucker rod is in place;

b. guide means connected to the ring means and extending in opposite directions from spaced ends of the ring means and arranged between the ring means and sucker rod for



cooperating with the sucker rod and aligning and centering the ring means relative to the sucker rod; and

c. passage means forming open space slots between the ring means and guide means for permitting the flow of oil and paraffin particles around the guide means and through the ring means; the double-ended scraper tool being designed to ride and move freely up and down between spaced apart stop means provided on an oil well sucker rod such that paraffin particles are scraped off of the interior walls of oil well tubing by any up-and-down movement of the double-ended paraffin scraper tool.

3,912,008

SUBSURFACE WELL BORE SHIFTING TOOL

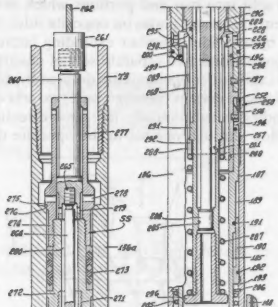
Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Division of Ser. No. 275,910, July 28, 1972, abandoned, which is a division of Ser. No. 243,806, April 13, 1972, Pat. No. 3,771,603. This application June 3, 1974, Ser. No. 475,587

Int. Cl. E21b *23/00*

U.S. Cl. 166—212 **11 Claims**

1. A shifting tool for moving an element longitudinally with respect to the tubular body of a well tool connected in a well pipe and having a bore in which said element is disposed, said shifting tool comprising: a mandrel adapted to be lowered through said pipe into said body, normally retracted latch means carried by said mandrel and expansible into engagement with said element, actuator means movable downwardly along said mandrel and said latch means to engage and expand said latch means outwardly to a position of engagement with the element, enabling joint downward movement of said actuator means and latch means to shift said element downwardly with respect to said body, and means carried by said mandrel and engageable with said actuator means to move said actua-



tor means upwardly of said latch means to a position enabling said latch means to retract from said expanded position.

3,912,009

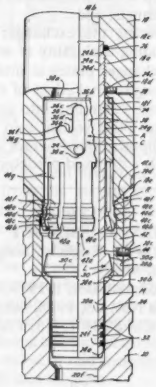
LATCH-IN ADAPTER

Philip E. Davis, Jr., P.O. Box 35729, Houston, Tex. 77035

Filed June 12, 1974, Ser. No. 478,644

Int. Cl.² E21B *23/02*

U.S. Cl. 166—240 **14 Claims**



1. In combination with a latch-in adapter and a latch-in receiver of the type adapted to be mounted with a pipe string in a well bore for downhole latching, the improvement residing in the latch-in adapter which comprises:

an inner mandrel having a bore therethrough, through which fluid may flow;

a latch means on said mandrel for latching engagement with the latch-in receiver;

connection means for connecting said latch means with said mandrel for longitudinal and rotational movements therebetween to transmit movements of said mandrel to said latch means in a running-in position and in a released position;

a lock means on said mandrel and movable longitudinally therewith for engagement with said latch means in a

locking position to prevent upward longitudinal movement of said mandrel; and

said connection means including means operable after rotational movement of said mandrel relative to said latch means for positioning said lock means in the released position out of engagement with said latch means, and for thereafter preventing relative longitudinal movement between said latch means and said lock means to hold same in the released position when moving said mandrel upwardly.

3,912,010
OVERBASED BRANCHED CHAIN ALIPHATIC SULFONATE WATERFLOOD

Charles R. Clark; M. Duane Gregory, both of Ponca City, Okla.; Delmar D. Krehbiel, Lubbock, Tex.; Claud D. Butler, and Carl D. Kennedy, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

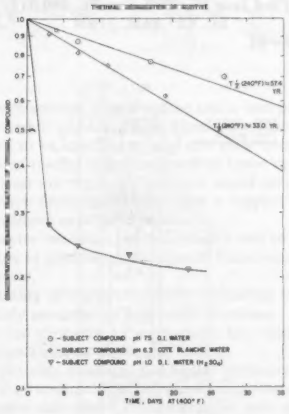
Division of Ser. No. 324,909, Jan. 19, 1973, Pat. No. 3,865,735. This application Oct. 15, 1974, Ser. No. 514,963
Int. Cl. E21b *43/22, 43/27*
U.S. Cl. 166—270 **12 Claims**

1. A method for recovering hydrocarbons from a petroliferous subterranean formation which comprises injecting into the formation an effective amount of an aqueous mixture which comprises about 0.5 to 25 weight percent of an overbased sulfonate derived from a non-linear alkene containing about seven to about 18 carbon atoms per molecule in which the overbased sulfonate contains an excess of base component such that the ratio: "weight of excess base component/weight of sulfonate" is about 0.03 to about 2.0; and withdrawing from the formation, hydrocarbon which has been displaced by the anionic water flood additive containing mixture.

3,912,011
SECONDARY RECOVERY METHOD

Jim Maddox, Jr.; Jack F. Tate, and Russell D. Shupe, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,985
Int. Cl.² E21B *43/22, 43/27*
U.S. Cl. 166—271 **14 Claims**



1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation an aqueous acidic solution of 0.5% to 28% by weight of a non-oxidizing mineral acid and from about 0.005% to about 2% by weight of a compound therein and recovering hydrocarbons through the production well, said compound being a water-soluble sulfonated, ethoxylated compound having the general formula

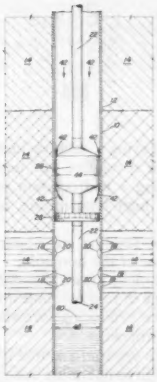
$$R(OCH_2CH_2)_nSO_3^-A^+$$

wherein R is an aliphatic hydrocarbon group containing from about 8 to about 20 carbon atoms, *n* is a number from one to about ten, including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, including mixtures.

3,912,012
METHOD FOR REMOVING PLASTIC FROM THE INSIDE DIAMETER OF WELLBORE CASING

Roy E. Bush, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 9, 1974, Ser. No. 495,931
Int. Cl.² E21B *33/138, 37/02*
U.S. Cl. 166—285 **2 Claims**



1. In a method for treating subterranean formations penetrated by a wellbore containing a casing by injecting plastic materials into a selected formation, said method consisting essentially of:

a. perforating said casing in the portion of said wellbore penetrating said selected formation;

b. positioning a tubing string in said wellbore so that the lower terminus of said tubing string is below said selected formation;

c. positioning a packer means above said selected formation;

d. injecting plastic materials into said selected formation through said tubing string and said perforations;

e. removing said packer and said tubing string from said wellbore; and

f. passing a casing scraper through said casing to clean the plastic from the inside diameter of said casing;

the improvement comprising,

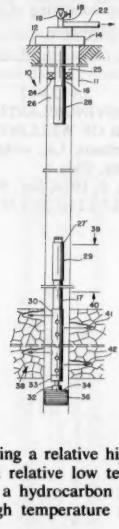
g. positioning a scraper means beneath said packer means of (c) and above said selected formation;

h. lowering said scraper means past said selected formation after the injection (d) of said plastic materials and prior to removing said packer and said tubing string (e) thus removing plastic from the inside diameter of said casing.

3,912,013
HIGH TEMPERATURE PERFORATING METHOD

Roy R. Vann, Box 38, Artesia, N. Mex. 88210

Filed Nov. 11, 1974, Ser. No. 522,529
Int. Cl.² E21B 29/02, 43/11
U.S. Cl. 166—297 12 Claims



1. In a borehole having a relative high temperature zone located downhole of a relative low temperature zone, the method of completing a hydrocarbon producing formation located within said high temperature zone comprising the steps of:

1. suspending a perforating gun apparatus within the low temperature zone of the borehole;
2. placing an abutment means downhole within said high temperature zone of said borehole and in close proximity of a hydrocarbon producing formation for arresting the gun when it is dropped;
3. dropping the gun apparatus so that it falls downhole from the low to the high temperature zone, and impacts against said abutment means;
4. detonating the gun apparatus by using the force resulting from the gun apparatus impacting against the abutment.

3,912,014
METHOD AND APPARATUS FOR RE-POSITIONING THE END OF REMEDIAL TUBING ON AN OBSTRUCTION IN A SUBTERRANEAN WELL

Rodney J. Wetzel, St. Martinville, La., assignor to Dixieco, Inc., Lafayette, La.

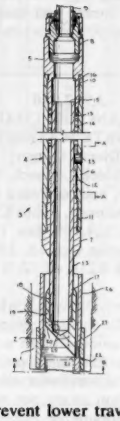
Filed Mar. 25, 1974, Ser. No. 454,377
Int. Cl.² E21B 23/00, 43/00
U.S. Cl. 166—315 19 Claims

16. In a subterranean well having a tubular element inserted therethrough, an apparatus for re-positioning the end of tubing for by-passing an obstruction depending from said tubular element comprising:

A. An outer tubular housing connected to said tubing;
B. A control mandrel therein;
C. Means for producing rotary motion between the housing and the mandrel in response to longitudinal motion of the tubing; and
D. Means on the lower end of the mandrel for by-passing the obstruction.

18. A method for re-positioning the end of tubing for by-passing an obstruction in a subterranean well, comprising the steps of:

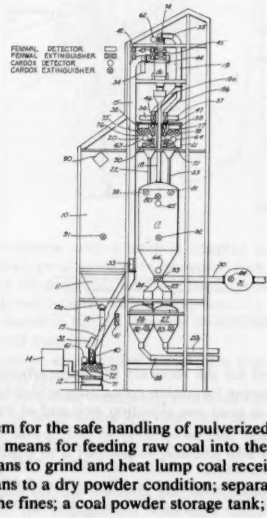
A. Lowering in the well said tubing, to the lower end of which is attached an apparatus having: (1) an outer tubular housing; (2) a control mandrel therein; (3) means for producing rotary motion between the housing and the mandrel in response to longitudinal motion of the tubing; and (4) means attached to the lower end of the mandrel for by-passing the obstruction;
B. Activating the apparatus by longitudinally contacting the means attached to the lower end of the mandrel and the obstruction to prevent lower travel of the mandrel and initiate rotational movement of the means for producing rotary motion;
C. Raising the apparatus to cause additional rotational travel of the means for producing rotary motion; and
D. Lowering the apparatus to permit the means attached to the lower end of the mandrel to by-pass the obstruction.



3,912,015
SYSTEM FOR THE SAFE HANDLING OF PULVERIZED COAL

Allen K. Garbee, Lebanon, Ohio; John A. Honaker, Huntington, W. Va., and James R. Sexton, Monroe, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed June 17, 1974, Ser. No. 480,013
Int. Cl.² A62C 37/04
U.S. Cl. 169—61 9 Claims



1. A system for the safe handling of pulverized coal including: loading means for feeding raw coal into the system; pulverizing means to grind and heat lump coal received from the loading means to a dry powder condition; separator means to divide out the fines; a coal powder storage tank; filter means;

first duct means connecting the pulverizing means to the separator means; second duct means connecting the separator means directly to the storage tank; third duct means connecting the separator means to the filter means; fourth duct means connecting the filter means to the storage tank; a plurality of explosion detectors; a plurality of explosion extinguishers; means interconnecting said explosion detectors and said explosion extinguishers so that when pressures above normal operating pressures develop said explosion extinguishers will be actuated; a said explosion detector in close association with said pulverizing means and a said explosion extinguisher for discharging explosion suppression agent into said pulverizing means; a said explosion detector in close association with said separator means and a said explosion extinguisher for discharging explosion suppression agent into said separator means; a said explosion detector in close association with said filter means and a said explosion extinguisher for discharging explosion suppression agent into said filter means; and means interconnecting said explosion detectors with said loading means, said pulverizing means and said separator means so that when said explosion extinguishers are actuated said loading means, said pulverizing means and said separator means are simultaneously inactivated whereby to shut down the system.

3,912,016

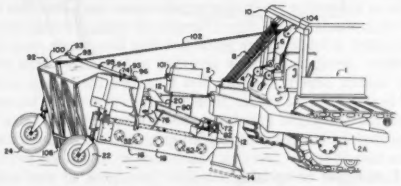
HYDRAULICALLY POWERED ROOT AND SOIL SEPARATING AND WINDROWING APPARATUS

Winfred A. Arnold, P.O. Drawer B, Three Rivers, Tex. 78017

Continuation-in-part of Ser. No. 242,725, April 10, 1972, Pat. No. 3,821,988. This application Apr. 24, 1974, Ser. No. 463,748

Int. Cl.² A01D *19/02*

U.S. Cl. 171—133 **10 Claims**



10. In combination with a tractor and a root plow adapted to be attached to said tractor, root and soil separating apparatus adapted to be attached to said root plow comprising

a. a pair of spaced apart, longitudinal frame members,

1. at least one rotatably mounted wheel on the rear end of each frame member to form a support therefor for movement over the terrain,

b. connector members on the forward end of each frame member to pivotally connect each frame member to said root plow,

c. a plurality of transverse shafts extending between and rotatably mounted on said frame members,

1. beater elements on each shaft, for rotation of said beater elements above the terrain,

d. said plurality of shafts and beater elements thereon so spaced as to direct roots upwardly and rearwardly along the upper side of the circumferential path described by said beater elements,

e. a transverse brace detachably secured to a selected portion of each frame member,

f. hydraulically activated means connected in driving relation with said shafts to rotate said beater elements to dislodge soil from the roots as the roots are moved upwardly and rearwardly,

g. a root catcher pivotally mounted on the rear end of said root and soil separating apparatus, and

h. control means to operate said root catcher from a remote position.

3,912,017

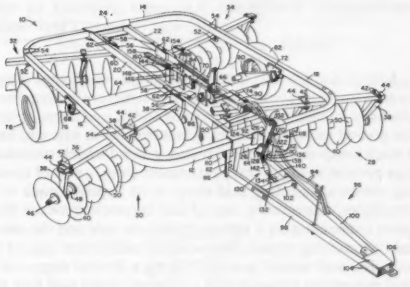
AUTOMATIC LEVELING MECHANISM FOR DISK HARROWS

Gary Allen Rehn, Andover, Ill., assignor to Deere & Company, Moline, Ill.

Filed June 21, 1973, Ser. No. 372,377

Int. Cl.² A01B *59/00*

U.S. Cl. 172—328 **19 Claims**

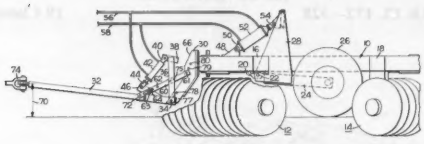


1. A disk harrow comprising: a frame; ground-engaging disk gangs supported on the front and rear portions of the frame; wheel control shaft means supported on the frame for rotation about a transverse axis; wheel arm means connected to the shaft means and extending downwardly and rearwardly therefrom; ground-engaging wheel means rotatably supported on the outer ends of the arm means between the front and rear disk gangs; means for rotating the wheel control shaft means relative to the frame to raise and lower the frame relative to the wheel means and thereby raise and lower the frame relative to the ground; an upright arm secured to the wheel control shaft means and extending upwardly therefrom, said arm being movable rearwardly with the shaft as the latter is rotated to lower the wheel means relative to the frame; a trunnion mounted on the upper end of the arm for rotation about a transverse axis; a hitch structure connected to the forward end of the frame for vertical pivotal movement about a transverse axis, said structure extending forwardly of the frame and having tractor attaching means on its forward end movable vertically relative to the frame as the structure is pivoted about said transverse axis; a lever mounted on the forward end of the frame for pivotal movement about a transverse axis disposed above the pivot axis of the hitch structure, said lever having a lower end extending below and an upper end extending above the pivot axis of the lever; stop means on the lever engageable with the frame to limit rearward movement of the upper end of the lever relative to the frame; a compression link connecting the lower end of the lever to the hitch structure at a point forwardly of the pivot axis of the structure; a fore-and-aft extending tension link, the forward end of the link being pivotally connected to the upper end of the lever and the rear portion thereof being slidably received in the trunnion and extending rearwardly therethrough and terminating at a rear end; and a compression spring acting between the trunnion and the rear end of the tension link for biasing the tension link rearwardly relative to the trunnion and thereby biasing the stop means on the lever toward the frame.

3,912,018
HYDRAULIC TRANSPORT, LEVELING, AND HITCHING MECHANISM

John F. Brundage, Camarillo, and James J. McKay, Oxnard, both of Calif., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 353,208, April 20, 1973, abandoned.
This application Aug. 22, 1974, Ser. No. 499,762
Int. Cl.² A01B 63/22, 59/00, 51/00; B60D 7/00
U.S. Cl. 172—328 5 Claims

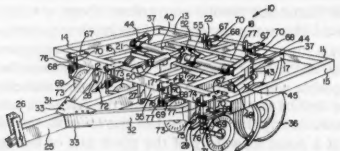


1. In a disc harrow, a frame structure, disc gangs attached to said frame structure, a hitch pole structure having one end pivotally connected to the forward end of said frame structure for pivotal movement about a first transverse axis and having a hitch component at its other end, ground wheels mounted on legs pivoted to said frame, a transport strap, a pair of connecting means connecting said strap at its opposite ends to said structures, respectively, one of said connecting means being a pivot connection on a second transverse axis and the other of said connecting means a lost motion connection spaced from said first and second axes permitting a limited degree of pivotal movement between said structures about said first transverse axis, a leveling arm pivoted at one end about said first transverse axis and having its other end in abutable relation to one of said structures, a first hydraulic ram connected at one end to the other of said structures and at its other end to said leveling arm at a point spaced from said first transverse axis, said upper end of said leveling arm abutting said one structure on extension of said first ram, a second hydraulic ram connected between one of said legs and said frame structure and being operative to move said wheels into ground engaging position and to retract said wheels to permit discing, both of said rams being double acting rams and being connected in parallel so that when said rams are extended said disc gangs are raised to transport position while the hitch pole structure is swung downwardly about said first transverse axis to maintain the frame structure substantially level.

3,912,019
CHISEL PLOW BRACKET ASSEMBLY

Herbert W. Baughman, Vermont, Ill. 61484, and Harry G. Yetter, Colchester, Ill. 62326

Division of Ser. No. 366,152, June 1, 1973, Pat. No. 3,812,919.
This application Dec. 26, 1973, Ser. No. 427,796
Int. Cl.² A01B 35/20, 39/22
U.S. Cl. 172—691 2 Claims

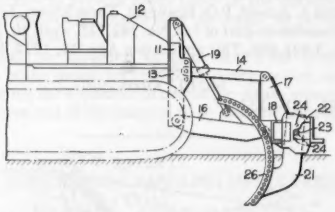


1. An earth working apparatus having a rigid frame carrying a plurality of earth working devices, a bracket assembly for securing one or more of said earth working devices on said rigid frame, means to secure said bracket assembly on said frame said means being adjustable horizontally in a transverse direction on said frame, means to adjust said earth working device vertically on said bracket assembly, said bracket assembly comprising a pair of upper and lower clamp plates secured respectively above and below a transverse member of said rigid frame, means clamping said plates to said transverse member, a third clamp plate spaced below said lower clamp plate, the horizontal portion of a cultivator supporting member being disposed between said lower clamp plate and said third clamp plate, said means clamping said plates to said transverse member securing said supporting member in said bracket assembly, said upper clamp plate and said third clamp plate each having a vertically disposed clamping surface, and means clamping a vertical portion of a second type cultivator to said vertically disposed clamping surfaces.

3,912,020
RENEWABLE SELF-SHARPENING RIPPER TOOTH

Harvey Whiting Rockwell, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Apr. 1, 1974, Ser. No. 456,661
Int. Cl.² A01B 13/08
U.S. Cl. 172—699 23 Claims



1. A ripper comprising:

a vertically disposed shank having a front edge and a rear edge, with the distance between said edges being several times greater than the width of said shank, said shank having a forwardly projecting arcuate tooth mounting portion at its lower front edge, said mounting portion being provided with a pair of vertically spaced apart transverse pin receiving holes,

an arcuate tooth of substantially constant transverse cross sectional configuration, said tooth comprising a forward portion wider than said shank and a rearwardly projecting portion, one of either said tooth mounting portion or said rearwardly projecting portion being provided with a groove and the other of said tooth mounting portion or said rearwardly projecting portion being provided with a projection which engages said groove so that said rearwardly projecting portion of said tooth is slidably engaged with said mounting portion of said shank,

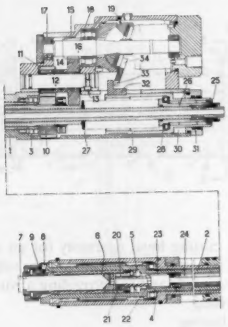
said rearward portion of said tooth being provided with a plurality of transverse pin receiving holes circumferentially spaced from each other along the length of said tooth and selectively alignable with said pair of pin receiving holes in said shank as said tooth is adjusted relative to said shank as the lower end of said tooth wears away,

and a pair of flush-mounted pins for releasably securing said tooth to said shank, each pin being releasably engageable with a pin receiving hole in said shank and a pin receiving hole in said tooth.

3,912,021
DRILLING AND BORING HEADS

Jean Cloup, 3360 Latresne, France

Filed Nov. 29, 1973, Ser. No. 420,317
Claims priority, application France, Dec. 27, 1972, 72.46447
Int. Cl.² B23B 47/08; E21C 1/02
U.S. Cl. 173—46 4 Claims

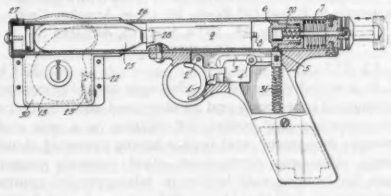


1. In a tool head comprising a body, a hollow spindle rotatably supported in said body, a chuck secured to one end of said spindle for rotation therewith, drive means for rotating said spindle, said drive means including variable speed motor means, control means associated with said motor means for varying the speed of said motor means according to the position of said control means, a rod slidably received in said spindle, said rod being coaxial with the chuck and axially spaced therefrom, stem means axially connecting said chuck and rod, said stem means being selectively adjustable relative to said chuck to vary the overall length of said chuck and rod, said stem means and said rod being axially slidable relative to each other and having opposed abutting surfaces, resilient means associated with said rod and said spindle to bias said opposed surfaces into engagement, means secured to said rod for axial movement therewith and being engagable with said control means for changing the position thereof according to said overall length of said chuck and rod, whereby said stem means can be selectively adjusted relative to said chuck to change said overall length of said chuck and rod and thereby change the position of the control means to vary the speed of the motor means.

3,912,022
PORTABLE POWER IMPACT WRENCH

Howard C. Smith, Secane, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 20, 1974, Ser. No. 471,430
Int. Cl.² B25D 15/00
U.S. Cl. 173—93.7 10 Claims



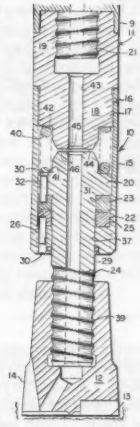
1. Portable impact wrench for delivering a one-shot impact to loosen a nut comprising:

a. a housing;
b. an energy source associated with the hoursing;
c. a rotatable bit, rotatory impact means coupling said rotatable bit to the energy source whereby energy is transmitted from the source to the bit; and
d. actuator means associated with said impact means and said energy source comprising trigger means coupled with a compressed spring actuated means whereby the compressed spring activates a striker which releases a one-shot burst of energy from said energy source to said impact means to cause only a one-shot impact on said rotatable bit to break the initial tightness of the nut.

3,912,023
ROCK BIT DECOUPLER

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,587
Int. Cl.² E21B 11/02
U.S. Cl. 173—131 4 Claims

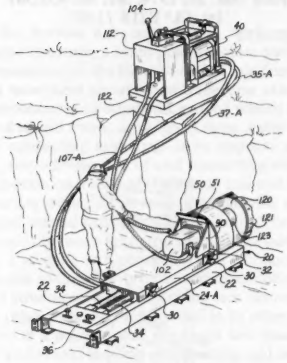


1. The combination comprising a continuously rotating string of drill pipe having an impact transmitting face at its bottom end, a rock bit rod having an impact receiving face at its upper end in opposed normally spaced relation to the impact transmitting face and carrying at its opposite end a rock bit, a spring load, clutch means carried in part by the pipe and in part by the rod normally engaging under the spring load the pipe with the rod for transmitting the rotation of the pipe to the rod and normally spacing the impact transmitting face axially clear of the impact receiving face during transmission of rotation of the pipe to the rod, and the clutch means being responsive to downward axial movement of the pipe relative to the rod against the spring load to disengage the pipe from transmitting its rotation to the rod and to simultaneously allow the impact transmitting face of the pipe to move into impacting relation with the impact receiving face of the rod.

3,912,024
POWER TRAIN FOR HORIZONTAL EARTH BORING MACHINE

Albert R. Richmond, West Salem, and William S. Appleman, Ashland, both of Ohio, assignors to The Richmond Manufacturing Company, Ashland, Ohio

Continuation-in-part of Ser. No. 153,281, June 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 85,600, Oct. 30, 1970, Pat. No. 3,679,006. This application Apr. 25, 1973, Ser. No. 354,387
Int. Cl. E21c *1/10*
U.S. Cl. 173—152 8 Claims

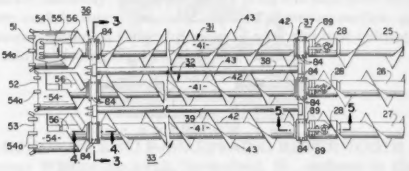


2. A portable earth boring machine comprising, in combination, track means; frame means mounted for movement along said track means, including a removable engine frame portion and a control mount; an engine means carried by said engine frame portion; variable volume pump means carried by said engine frame portion; control means for said pump means, said control means being removably mounted on said control mount and disposable in a control location remote from said engine frame portion; fluid motor means mounted on said frame means and connected in a fluid system with said pump means; a gear reduction unit mounted on said frame means and including a gear reduction input shaft driven by said fluid motor and a gear reduction output shaft; a thrust plate forwardly of said gear reduction unit; thrust bearing means mounted on said thrust plate; auger connecting shaft means including a front end for connection with an earth boring auger and a rear end including a bearing engaging shoulder abutting said thrust bearing means and a coupling portion in driven connection with said gear reduction output shaft; detachable mounting means for removing said engine frame portion, engine, and pump means to an engine frame location remote from the other above mentioned components of said machine when said machine is disposed in an earth boring location; and fluid conduit means in said fluid system connecting said fluid motor in remote driven relationship with said pump means, said control means being operative in said fluid system for controlling the speed of said fluid motor means when said control means is in said control location.

3,912,025
MULTIPLE CUTTING HEAD ASSEMBLY FOR AUGER MINING MACHINE

Ronald C. Deeter, Malvern, and Thad A. Lora, Salem, both of Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Nov. 6, 1974, Ser. No. 521,332
Int. Cl.² E21C *25/58*
U.S. Cl. 175—91 8 Claims



1. A multiple cutting head assembly for an earth augering machine having power means for advancing said cutting head assembly into the earth and for providing a rotary drive, said assembly comprising:

a rigid frame having

a front bearing housing assembly and a rear bearing housing assembly rigidly connected to said front bearing housing assembly, each of said bearing housing assemblies comprising

a cross member,

a plurality of bearing retainer caps adapted to be removably connected to said cross member and a plurality of journal bearing units, one being retained between each cap and the respective cross member, a plurality of head augers rotatably supported by said frame with their axes parallel and approximately in a common plane, each of said head augers comprising

an auger tube with spoil conveying external helical flights, a front shaft rigidly connected to the front end of said auger tube and journaled in said front bearing housing assembly, a shank shaft rigidly connected to the rearward end of said auger tube and journaled in said rear bearing housing assembly, a rotary cutting head removably secured to said front shaft forwardly of said front bearing housing assembly, and means for connecting said shank shaft to said power means whereby all of said head augers are rotated in their respective journal bearing units as said cutting head assembly is advanced into the earth and whereby each of said head augers may be selectively removed from said rigid frame by disconnecting the respective bearing caps from the respective cross member.

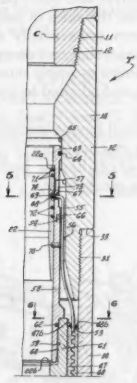
3,912,026
FLUID PRESSURE LOCKED WELL DRILLING TOOL

Talmadge L. Crowe, Houston, Tex.; David V. Chenoweth, Honolulu, Hawaii, and David M. McStravick, Houston, Tex., assignors to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Feb. 25, 1974, Ser. No. 445,055
Int. Cl.² E21B *1/10*
U.S. Cl. 175—297 30 Claims

1. In a well drilling tool: a telescopic assembly comprising an elongated inner body and an elongated outer body, means interconnecting said bodies for rotation as a unit and for telescopic movement, said bodies having opposing shoulders limiting telescopic contraction, fluid pressure responsive means for holding said bodies in telescopically contracted condition with said shoulders tightly engaged, said fluid pressure responsive means including means preventing all relative longitudinal movement between said bodies from said contracted condition to retain said shoulders tightly engaged, and

trigger means operable by a tripping device for releasing said fluid pressure responsive means to permit disengagement



between said shoulders and telescopic extension of said bodies with respect to each other.

3,912,027

PRICE-INDICATING SCALE

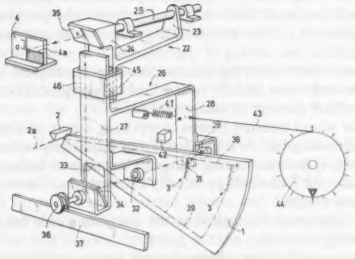
Josef Schwarz, Balingen, Germany, assignor to Bizerba-Werke Wilhelm Kraut KG, Balingen, Germany

Filed Jan. 16, 1975, Ser. No. 541,407

Claims priority, application Germany, Jan. 17, 1974, 2402108

Int. Cl.² G01G *23/22, 23/32*

U.S. Cl. 177—40 **7 Claims**



1. In a price-indicating scale, a combination comprising a frame having a first portion turnable about a turning axis, and a second portion mounted for straight-line movement; and an optical price-indicating system, comprising a translucent dial having a plurality of price scales and movable in dependence upon a weight on the scale, an objective at one and a light-source at the other side of said dial, said objective being mounted on said second portion of said frame and having an optical axis parallel to said turning axis, a stationary projecting screen, and a pair of mirrors respectively mounted on said first and second portions for directing a light beam from said objective onto said screen, said mirrors being telescopically shiftable relative to one another in the direction in which said light beam travels from one to the other of said mirrors, one of said mirrors being mounted on said optical axis and the other mirror being mounted on said turning axis.

3,912,028

PRICE-INDICATING WEIGHING MACHINE

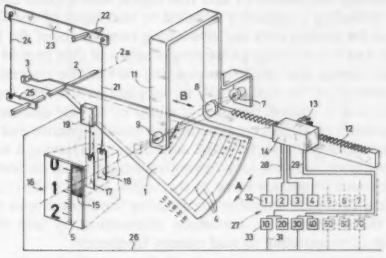
Josef Schwarz, Balingen, Germany, assignor to Bizerba-Werke Wilhelm Kraut KG, Nalingen, Germany

Filed Jan. 24, 1975, Ser. No. 543,921

Claims priority, application Germany, Jan. 31, 1974, 2404521

Int. Cl.² G01G *23/22, 23/32;* G03B *21/00*

U.S. Cl. 177—44 **8 Claims**



1. A price-indicating weighing machine, comprising a weighing system including a weight-dependently movable dial having a plurality of price scales each indicating the price-per-weight on the basis of a different unit price; a projection screen; an optical system movable relative to said dial in dependence upon a selected unit price and operative for projecting onto said screen a portion of that price scale which is most closely associated with said selected unit price; and indicator means for indicating the price of a weighed item on the projected portion of a price scale on said screen, said indicator means being fixable so as to indicate the starting values and end values of the projected price scale under no-load and full-load conditions of the machine, respectively, and also being selectively and weight-dependently movable so as to indicate the starting value but a different end value of the projected scale portion under said respective load condition, said end value being based upon a unit price different from that of the projected scale portion.

3,912,029

WEIGHING APPARATUS

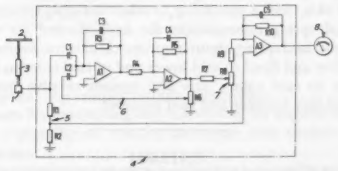
Leonard Francis Gorman, Farnborough, and Leslie John Parry, Bracknell, both of England, assignors to Weighwrite Limited, England

Filed Aug. 21, 1974, Ser. No. 499,117

Claims priority, application United Kingdom, Aug. 23, 1973, 40056/73

Int. Cl.² G01G *3/14;* H03B *1/04*

U.S. Cl. 177—210 **3 Claims**



1. Apparatus for weighing vehicles in motion, comprising a support member across which vehicles to be weighed will travel, a transducer arranged to produce a first electrical signal indicative of the force applied to the support member when a vehicle passes over it, and a filter circuit for selectively attenuating an alternating component in said first electrical

signal, said filter circuit having an input, and comprising a differential amplifier which has first and second inputs, and which is operative to produce an output according to the difference between signals applied to the first and second inputs, a first circuit path extending from the input of the filter circuit to the first input of the differential amplifier, for feeding to said first input at least a portion of said first signal, and a second circuit path extending from the input of the filter circuit to the second input of the differential amplifier for feeding to said second input a second signal derived from the alternating component of said first signal, said second circuit path including a capacitor coupled to said input of the filter circuit for passing only the alternating component of the first signal and for ensuring phase synchronism of that part of the second signal, and the corresponding part of the alternating component of the first signal, as supplied to the first input, which is at a chosen frequency, a pair of serially connected operational amplifiers coupled between said capacitor and the second input to the differential amplifier, each having a reactive negative feedback loop having impedances that determine said chosen frequency to be in the region of 3Hz, the output of the differential amplifier constituting the filter circuit output, the frequency of maximum attenuation by said filter circuit corresponding to said chosen frequency.

3,912,030

SNOWMOBILE SKI MOUNTING ARRANGEMENT

Guy D. Payne, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 10, 1973, Ser. No. 396,014
Int. Cl.² B62M *27/00*
U.S. Cl. 180—5 R **2 Claims**

1. A snowmobile including a chassis, a pair of skis each having a ground-engaging surface with a fore and aft centerline, and separate means connecting each of said skis to said chassis for support of said chassis and for permitting turning of said skis relative to said chassis about respective axes which diverge downwardly when seen from in front and which respectively approximately intersect the fore and aft centerline of said ground-engaging ski surfaces, each of said mounting means including a member mounted for rotation relative to said chassis about one of said axes and including a lower end, a leaf spring connected adjacent its ends to the associated one of said skis, and a mounting bracket movably connected to said leaf spring intermediate the ends thereof for rotation relative to said spring about a horizontal axis transverse to said centerline and fixed to said lower end of said column in offset relation to said rotary axis and against relative movement between said bracket and said member.

3,912,031

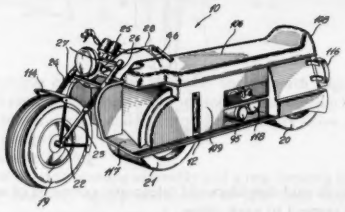
CONVERTIBLE VEHICLE FOR ALL SEASONS

Leo Goulet, R.R. No. 2, Montmagny, Quebec, Canada

Filed June 14, 1974, Ser. No. 479,423
Int. Cl.² B62M *27/02*; B62K *5/00*
U.S. Cl. 180—9.26 **3 Claims**

1. A three wheel in line wide track vehicle of the the motor cycle variety easily convertible to a snow vehicle capable of transporting at least three passengers comprising:

a. a torsion resistance elongated rectangular frame
b. engine means transversally mounted on said frame and coupled to the rear wheel to effect rotation
c. a seat mounted on top of said frame capable of accomodating the driver and other passengers having their legs straddles about the sides of said frame
d. three parallel axes transversally suspended from said frame by shock absorbing and dampening means
e. a steering mechanism movably mounted on the forward end of said frame and adapted to control the direction of the vehicle
f. a rear traction wheel having steerable means coupled to the front steering mechanism
g. a rear traction wheel having braking means operated from said steering mechanism



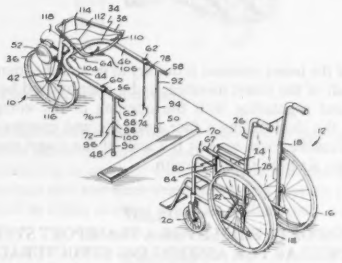
h. said front steering means including a steering column secured to said frame
i. a handle bar rotably carried in said steering column and having steerable means connected to said rear traction wheel
j. an intermediate wide track wheel the axle of which is pivotally mounted on the lower frame with vertical guides and shock absorbing and dampening means
k. an open rear end frame pivotally connected to the lower tubular frame and suspended from the upper frame by shock absorping and dampening means so to permit said wheel to rise up and down to follow the ground profile
l. a pair of open slotted members pivotally suspended from the lower end frame to provide means for varying the angularity of the transversally suspended rear axle to facilitate the turning of the vehicle.
m. rear wheel steering means pivotally connected to the rear end frame and the rear wheel axle spherical bearings to effect turning of said wheel
n. rear wheel steering means comprising a pair of direction cables attached to a pivoted T bar adjustably connected to the spherical bearing flanges, tie connections and fork rods, said T bar being pivotally connected to the rear end lower frame
o. resilient means attached to the direction cable for maintaining tautness
p. rear wheel roller chain driving means coupled to the motor transmission sprocket capable of maintaining alignment of said chain with said sprocket independantly of the angularity of said rear wheel
q. rear wheel axle comprising two splined telescopic sections, a wheel drum and disc brake attached to the female section, and sprocket driving means attached to the male section
r. spherical bearing in which the rear wheel axle sections are rotably suspended and slidably retained in the slotted extended rear end members and bolted to the respective steering flanges
s. brake retention means attached to the rear extended member to prevent the rotation of said disc brake
t. rear wheel traction chain guiding means attached to the male telescopic shaft spherical bearing flange comprising roller means riding on the face of said sprocket and means to maintain said traction chain in contact with the toothed circonference of said sprocket

u. traction chain tightness maintaining means comprising a pair of idlers, one rotably attached to the extended slotted member supporting the main driving sprocket and a displaceable idler rotably suspended from the chain guide so as to maintain tautness with the movement of the sliding spherical bearing due to variation in angular displacement of the rear wheel.

3,912,032
WHEELCHAIR-ATTACHABLE POWERED UNIT

William G. Benz, San Jose; Glenn G. Reynolds, Santa Cruz, and Charles W. Ricketts, Mountain View, all of Calif., assignors to The Benz Vehicle Corporation, San Jose, Calif.

Filed Nov. 26, 1973, Ser. No. 419,094
Int. Cl.² A61G 5/04; B60K 1/00
U.S. Cl. 180—13 **16 Claims**



1. A power attachment for use with a wheelchair of the type having a pair of hand operable drive wheels rotatably mounted on a frame having at least one castor wheel fixed against translation with respect to the frame, the power attachment comprising:

a powered unit frame,

at least one front wheel pivotally mounted on said powered unit frame, motor means mounted on said powered unit frame and selectively couplable to drive said front wheel, steering means coupled to said front wheel and being hand operable to pivot said front wheel relative to said powered unit frame,

first coupling means connectable to the wheelchair,

second coupling means connected to said powered unit frame for detachable connection to said first coupling means,

first locking means for detachably locking said first and second coupling means together when said first coupling means is connected to the wheelchair and the wheelchair is supported on the drive wheels and castor wheel, and

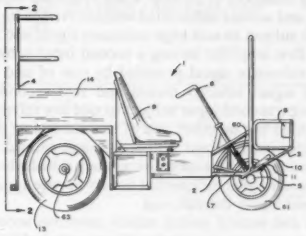
second locking means for locking said detachably locked first and second coupling means relative to the wheelchair frame when the wheelchair is tilted about the axis of the drive wheels and for maintaining the lowest portion of the caster wheel above the plane defined by the lowest portion of the drive wheels and the lowest portion of the front wheel.

3,912,033
HYDRAULICALLY OPERATED VEHICLE

John F. Ancel, St. Louis, Mo., assignor to Ancel Products, Inc., St. Louis, Mo.

Filed May 17, 1974, Ser. No. 470,928
Int. Cl.² B60K 27/00
U.S. Cl. 180—66 R **18 Claims**

1. In a hydraulically operated wheeled vehicle including a hydraulic pump for supplying a varying rate of fluid flow, said pump including a rotatably mounted input shaft, said shaft being rotatable in a clockwise direction and counterclockwise direction, at least one hydraulic drive motor operatively connected to said pump and adapted to drive a wheel of said vehicle in a forward direction and a rearward direction, the direction of said wheel drive being dependent upon the direction of rotation of the input shaft of said pump, means for driving said pump, and operator means for signalling a command input rotation to said pump input shaft, the improvement which comprises linkage means interposed between said signalling means and said pump input shaft, said linkage

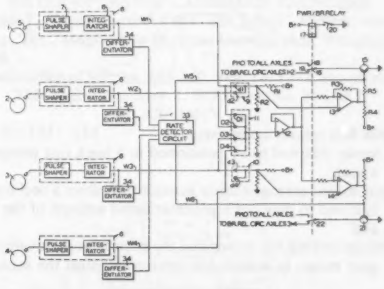


means comprising a lever arm mounted to said input shaft and adapted to rotate with said shaft about a shaft axis, said shaft and said lever arm having a neutral position, said lever arm being operatively connected to said signalling means, and means for varying the effective pivot point of said lever arm with respect to said input shaft so that the force required to rotate said input shaft in the clockwise direction is materially different from the force required to rotate said input shaft in the counterclockwise direction from the neutral position.

3,912,034
VELOCITY COMPARISON CIRCUIT FOR WHEEL SLIP CONTROL SYSTEM

Julius Pallof, West Mifflin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 25, 1972, Ser. No. 300,844
Int. Cl. B60k 27/02; B60t 8/10
U.S. Cl. 180—82 R **5 Claims**



1. A wheel slip control circuit comprising:

a. means for monitoring and converting the angular velocity of a plurality of rotating members into distinct speed signals;

b. first signal selector means including a plurality of diodes each subject at its anode terminal to a respective one of said speed signals, the cathode terminals of said diodes being interconnected so as to establish the voltage conducted by said diodes at a value corresponding to the greater one of said speed signals to provide a high reference signal;

c. second and third signal selector means each including:

i. a voltage divider network to which a source of energy is supplied; and

ii. at least two diodes subject at their cathode terminals to different ones of said speed signals associated with a first or second pair of said rotating members, the anode terminals of said diodes being interconnected at a center tap of said voltage divider network to establish the voltage thereat according to the lesser one of said speed signals of said first or second pairs of said rotating members to provide a low reference signal;

d. first and second differential amplifiers each having a first input subject to said high reference signal and an output, said first amplifier having a second input subject to said low reference signal provided by one of said second or third signal selector means and said second amplifier having a second input subject to said low reference signal provided by the other one of said second or third signal selector means, said output of each of said amplifiers providing a comparison discrepancy signal when a predetermined signal differential occurs between said first and second inputs thereof; and

e. first and second switch means operative according to a brake or propulsion mode of operation of said rotating members for connecting the output of said first and second amplifiers to either a brake or propulsion control circuit of at least a pair of said rotating members to effect a release of braking or power thereof responsive to said comparison discrepancy signal.

3,912,035

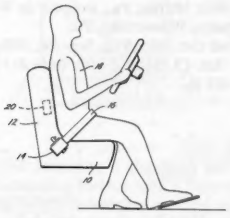
BELT RELAXER

Izaak A. Ulert, 3651 Dumbarton, Houston, Tex. 77025

Continuation-in-part of Ser. No. 364,642, May 29, 1973, abandoned. This application Feb. 25, 1974, Ser. No. 445,227

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **30 Claims**



1. A belt relaxer comprising,

a sensor adapted to be positioned in a back rest portion of a seat,

gear means arranged upon actuation to drive a reel for the belt and to play out a predetermined amount of the belt, and

linkage linking the sensor and the gear means activating the gear means in response to pressure against the sensor.

3,912,036

INSTRUMENT PANEL PAD WITH INTEGRAL DUCT SEAL

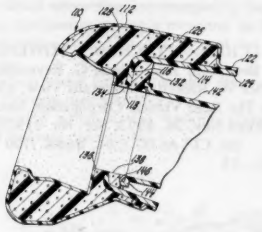
Thomas John Davis, Union Lake, and Daniel Anthony Jannette, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1974, Ser. No. 525,883

Int. Cl.² B60K *37/00*

U.S. Cl. 180—90 **1 Claim**

1. A padded instrument panel and duct assembly comprising: a vinyl skin, a rigid insert member spaced from the skin and having a wall with an opening therein, compressible foam filling the space between the skin and the insert member, the compressible foam also being located behind the wall of the insert member, an opening in the skin and the compressible foam registering generally with the opening in the wall of the insert member, the opening in the skin and the foam being lesser in dimension than the opening in the wall of the insert member so that the compressible foam on both sides of the



wall of the insert member is unitary to mount the foam behind the wall of the insert member, and a duct located behind the wall and registering with the opening in the compressible foam, the duct having a face engaging and compressing the compressible foam against the wall of the insert member to form an air-tight seal therewith.

3,912,037

TRANSPORT VEHICLE FOR A TRANSPORT SYSTEM, IN PARTICULAR FOR ASSEMBLING STRUCTURAL UNITS, FOR EXAMPLE MOTOR VEHICLES, FROM STRUCTURAL ELEMENTS

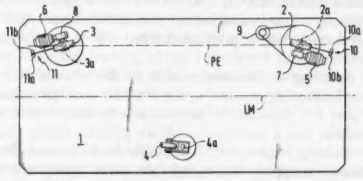
Walter Krieg, Brugg, Switzerland, assignor to Digitron AG, Brugg-Biel, Switzerland

Filed Feb. 6, 1974, Ser. No. 440,032

Claims priority, application United Kingdom, Feb. 6, 1973, 5812/73

Int. Cl.² B60K *26/00*

U.S. Cl. 180—98 **12 Claims**



1. A vehicle having a steering mechanism for causing said vehicle to follow a current-carrying wire, comprising:

at least three wheel means pivotal about parallel axes to effect a movement of said vehicle in a multitude of different directions, at least two of said wheel means having steering axes which intersect said current-carrying wire and selectively activated driving means connected thereto for rotatably driving said two wheel means, said steering axes of said two of said wheel means being contained in a theoretical plane spaced laterally from and parallel to a longitudinal centerline for said vehicle, the third one of said wheel means being located on the opposite side of said longitudinal centerline from said two wheel means;

selectively activated steering means for selectively pivoting each of said two wheel means about its respective steering axis to control the direction of travel of said vehicle along a path defined by said current-carrying wire; and

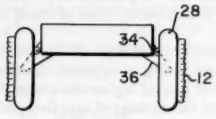
signal receiver means mounted on at least one of said two wheel means for sensing deviation of said vehicle from said wire and operable in association with said selectively

activated steering means to control the direction of travel of at least one of said two wheel means so that said steering axis of said one of said two wheel means is maintained in said intersecting relationship to said current-carrying wire.

3,912,038
AIR CUSHION WHEEL

Henry J. Bernaerts, R.F.D. 10, Box 1610, Annapolis, Md. 21401

Filed Nov. 5, 1973, Ser. No. 413,105
Int. Cl.² B60V 3/02
U.S. Cl. 180—126 15 Claims

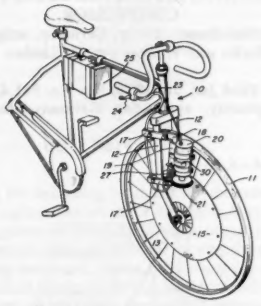


1. A vehicle support comprising:
a hub;
a wheel surrounding said hub and mounted to said hub for rotation independently thereof; and
means defining an open air cushion chamber on one of said wheel and said hub such that said vehicle support can be utilized as either a wheel or an air cushion pad.

3,912,039
BICYCLE DRIVE APPARATUS

Connie R. Ordemann, Rte. No. 1, Box 353B, Shakopee, Minn. 55379

Filed July 26, 1974, Ser. No. 492,224
Int. Cl.² B60K 17/30, 17/06
U.S. Cl. 180—33 D 7 Claims

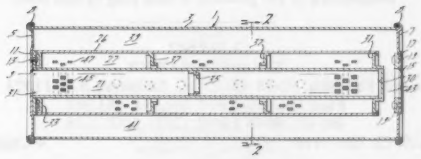


1. Apparatus for propelling a bicycle, comprising:
a. a bracket for clamping to the bicycle fork adjacent a wheel, said bracket having an elongated bearing surface extending generally parallel to said wheel;
b. a circular drive plate attached to the bicycle wheel adjacent said bracket;
c. a rotary power source having a drive wheel engageable against said drive plate;
d. a slideable assembly attached to said bracket and slideable over said bearing surface; and
e. means for attaching said rotary power source to said slideable assembly, whereby said drive wheel is slideable radially across said circular drive plate to vary the speed at which said bicycle wheel is driven, said means for attaching including a hinged clamp having an axis substantially parallel to said bicycle wheel, and means for biasing said power source inwardly toward said drive plate about said axis.

3,912,040
LOUVER CONSTRUCTION FOR EXHAUST GAS DEVICE

Robert N. Balluff, Rives Junction, Mich., assignor to Tenneco Inc., Racine, Wis.

Division of Ser. No. 242,995, April 11, 1972, Pat. No. 3,840,364. This application Aug. 15, 1974, Ser. No. 497,673
Int. Cl.² F01N 1/04; F16L 9/00
U.S. Cl. 181—42 4 Claims

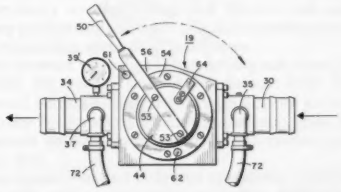


1. An exhaust gas treating device comprising a housing having a bed of acoustic packing material, a gas flow conduit to conduct gas to the bed comprising a metal tube forming an inlet side of the bed and having a longitudinal seam extending along its entire length and parallel to the axis of the tube and a plurality of circumferential rows of holes in the tube openings into said bed, each row being transverse to the seam and axis of the tube and containing a plurality of spaced substantially rectangular holes having their long sides extending parallel to said seam and axis and having rounded ends, said holes being substantially identical in size and shape and the spaces between adjacent holes in each row being substantially identical, the holes in adjacent rows being staggered so that the holes in one row are longitudinally aligned with the spaces in the adjacent rows, each row being longitudinally spaced from the adjacent rows, and lips formed in the tube to define each of said long sides and said rounded ends and extending at substantially right angles to the tube and away from the bed to direct gas flowing through them into the bed at substantially right angles to the planes of the holes.

3,912,041
WATER-OPERATED CARTRIDGE LAUNCHER

Thomas L. Slaven, Cardiff, Calif., and John C. Mollere, Nassay Bay, Tex., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 115,367, Feb. 16, 1971, abandoned. This application May 2, 1973, Ser. No. 356,653
Int. Cl.² G01V 1/02
U.S. Cl. 181—110 6 Claims



1. A method of sequentially loading seismic explosive cartridges in a cartridge launcher on a floating platform for delivery to an underwater seismic shooting site through a conduit towed by said platform, said method comprising:
interposing in said conduit a housing defining a passageway;
pumping water under pressure through said passageway;
intersecting said passageway with a plug rotatably mounted in a bore extending transversely of said passageway, said plug defining a barrel transversely thereof;

rotating said barrel from a cartridge-loading position, wherein the barrel communicates with atmospheric air, to a sealed-off position, wherein air and water are excluded from said passageway, and thence to a cartridge-unloading position, wherein said barrel is coaxial with said passageway whereby a cartridge in said passageway is ejected from said launcher into said conduit by the water pressure, and

continuously pumping water between the upstream and downstream portions of said passageway, on opposite sides of said bore, said downstream portion being connectable to said conduit, to thereby bypass said barrel irrespective of the position of said plug in said bore.

3,912,042

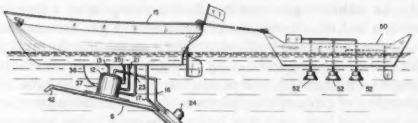
STEAM IMPLODER

Joseph Pauletich, 92-18 43rd Ave., Elmhurst, N.Y. 11373

Filed June 20, 1974, Ser. No. 481,067

Int. Cl. H04b *13/00;* **G01v** *1/02, 1/38*

U.S. Cl. 181—118 **4 Claims**



1. An underwater steam imploder comprising a vibratory shield having an interior implosion chamber, said shield being open sided and having in its normal or non vibrating condition an intermediate section and an end section, said sections being in separate planes, a valve in communication with said chamber and adapted to pass fluids incrementally therein, conduit means for admitting steam or a gaseous component to said valve and means for successively opening and shutting the valve.

3,912,043

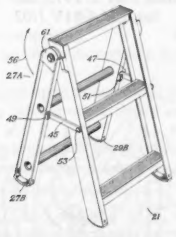
PIVOTED EXTENSION LADDER

James N. Brannan, 1705 Ems Road West, Fort Worth, Tex. 76116

Filed Aug. 19, 1974, Ser. No. 498,386

Int. Cl.² E06C *1/32, 1/18*

U.S. Cl. 182—23 **3 Claims**



1. A pivotal extension ladder comprising:

a first pair of leg means joined by an upper cross piece at their top ends and by at least one cross piece at a position spaced from their top ends,

a second pair of leg means having first and second opposite ends,

said second pair of leg means being joined by at least one cross piece at positions spaced from their first ends,

means for pivotally coupling said top ends of said first pair of leg means and said first ends of said second pair of leg means together to allow said first and second pair of leg means to be pivoted, between first and second positions, said first and second pair of leg means at said first position forming an acute angle relative to each other for forming a self-supporting ladder,

said first and second pair of leg means at said second position forming an angle of about **180°** relative to each other for forming an extended ladder having an increased length for use for reaching greater heights,

means for releasably holding said first and second pair of leg means together in said first position,

stop means on said first and second pair of leg means at their top and first ends respectively adapted to engage each other when said first and second pair of leg means are in their second position to prevent said first and second pair of leg means from pivoting beyond said second position,

said first and second pair of leg means having outward facing sides facing in opposite directions when said first and second pair of leg means are in their first position,

said outward facing sides of said first and second pair of leg means facing in the same direction when said first and second pair of leg means are in their second position,

said first pair of leg means defining the bottom portion of said ladder when extended,

said upper cross piece having a generally flat upper surface located at an angle relative to said first pair of leg means such that said upper surface is generally level when said first and second pair of leg means are located in their first position and supported on a level base,

said stop means comprising:

a first pair of stops located on opposite facing sides of said first pair of leg means, and

a second pair of stops formed on said second pair of leg means for engagement with said first pair of stops when said first and second pair of leg means are in their second position.

3,912,044

LUBRICATING SYSTEM FOR ROTARY PISTON COMPRESSOR

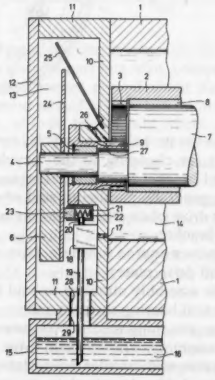
Gerhard Schindelhauer, Berlin, Germany, assignor to Borsig GmbH, Berlin and Wankel GmbH, Lindau, both of, Germany

Filed Jan. 16, 1975, Ser. No. 541,437

Claims priority, application Germany, Jan. 17, 1974, 2402029

Int. Cl.² F16N *13/20*

U.S. Cl. 184—6.16 **5 Claims**



1. In combination in a rotary piston compressor: main housing means, lateral housing means adjacent and laterally con-

nected to said main housing means, rotary piston means rotatable within said main housing means and with said main housing means and said lateral housing means defining a compression chamber, a reservoir for receiving and storing a lubricant, a diaphragm piston pump arranged in said lateral housing means, first conduit means establishing communication between said reservoir and said diaphragm piston pump, second conduit means leading from said compression chamber to said diaphragm piston pump, bearing means arranged within said lateral housing means, shaft means rotatably journalled in said bearing means and eccentrically connected to said rotary piston means, splash disc means fixedly and eccentrically connected to said rotary piston means and rotatable therewith, said diaphragm piston pump being operable to draw a lubricant from said reservoir and convey lubricant to said splash disc means, and wire means arranged within the sphere of action of said splash disc means and while being inclined relative to a horizontal plane leading to a point to be lubricated.

3,912,045
LUBRICATING PUMP

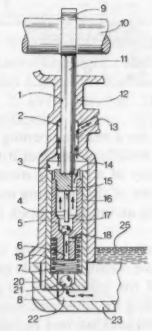
Alberto Jorge Morris, Dursley, England, assignor to R. A. Lister & Company Limited, England

Filed June 22, 1973, Ser. No. 372,855

Claims priority, application United Kingdom, Aug. 31, 1972, 40387/72

Int. Cl. F16n *13/02*; **F01m** *1/02*

U.S. Cl. 184—27 R **9 Claims**



9. A pump, for delivering lubricant to lubricate an internal combustion engine, comprising a casing, a bore defined by said casing, a piston reciprocally movable in said bore, operating means extending into the bore for moving the piston in one direction along said bore, means for moving the piston in an opposite direction along the bore, a liquid inlet defined at one end of said bore, an inlet chamber defined between said liquid inlet and the adjacent end of said piston, a liquid outlet defined towards the opposite end of said bore, an axial duct defined by said piston through which lubricant will flow between said inlet chamber and said outlet, a one-way valve provided in said axial duct arranged to close the axial duct when the piston moves in said opposite direction, said piston defining a transverse bore upstream of said one-way valve, said transverse bore constituting an air-vent interconnecting the axial duct and said inlet chamber upstream of said one-way valve to facilitate priming of the pump, said operating means being arranged to discharge lubricant through said outlet at a rate not exceeding the minimum lubricant demand at said outlet, and the piston being arranged to discharge lubricant through said outlet when moving in said opposite direction along the bore, the amount of lubricant discharged by movement of the piston in said opposite direction being dependent on the lubricant demand at said outlet.

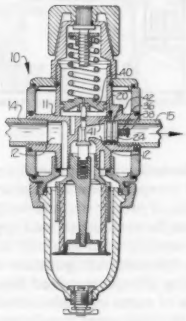
3,912,046
FLUID DEVICE WITH BACK PRESSURE VALVE ARRANGEMENT

George R. Ferguson, Clover, S.C., and David Leonard King, Jr., Charlotte, N.C., assignors to Duff-Norton Company, Inc., Charlotte, N.C.

Filed June 3, 1974, Ser. No. 475,658

Int. Cl.[2] **F16N** *7/30*

U.S. Cl. 184—55 A **9 Claims**



1. A fluid device comprising:

a body having a primary passageway therethrough for defining a portion of a conduit in which pressurized fluid flows and having at least one secondary passageway therein intersecting said primary passageway,

mounting means having a central stem portion with a longitudinal passageway therethrough, a spool portion encircling said stem portion, and a spoke portion with at least one radial passageway therethrough extending between said stem passageway and said spool portion, said mounting means being disposed within said primary passageway of said body with the outer periphery of said spool portion engaging the wall of said primary passageway at the location of intersection of said primary passageway and at least one secondary passageway, said stem passageway operatively communicating both directly with said primary passageway and through a radial passageway with a corresponding secondary passageway.

a back pressure valve member encircling said stem portion, means for biasing said back pressure valve member toward seating engagement with said spool portion and thereby for imposing at least a minimum drop in fluid pressure on fluid flowing through said primary passageway, and

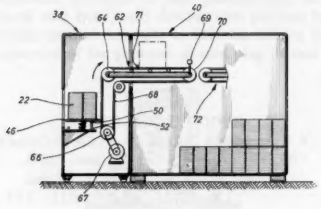
means mounted in said body and operatively communicating with said corresponding secondary passageway for performing one of (a) dispensing lubricant into fluid flowing through said primary passageway and (b) controlling the pressure of fluid flowing through said primary passageway,

said stem passageway and said corresponding radial passageway through said mounting means cooperating for establishing operative communication between said last-named means and a point in said primary passageway downstream of said back pressure valve member.

3,912,047
METHOD AND APPARATUS FOR COLLECTION OF NEWSPAPERS FOR RECYCLING

Joong Hee Chun, 11407 Brighton, and Bernard L. Shaw, 11426 Scottsdale, both of Stafford, Tex. 77477

Filed Sept. 30, 1974, Ser. No. 510,244
Int. Cl.² B65G *37/00*
U.S. Cl. 186—1 R 15 Claims



8. Apparatus for collection of paper for recycling and remitting payment of compensation to depositors for paper collected into bundles of proper size and weight and deposited at a collection center for such paper, said apparatus comprising:

a paper bundle module of a size and configuration corresponding to the size and configuration of the paper to be collected and being of predetermined dimension for accumulation of a bundle of paper of predetermined size and weight;

means provided on said paper bundle module for receiving bundle binding means that is employed after collection of a bundle of paper of predetermined size for binding the bundle of collected paper as the collected bundle of paper is disposed within said collection module;

paper receiving, inspection and storage means defining a collection center for bound bundles of paper of proper size and weight and including a receiving module and a storage module;

weight inspection means being provided on said receiving module, said weight inspection means having acceptance and rejection signal means and providing one of said acceptance and rejection signals responsive to the weight of the bundle of paper placed at said weight inspection means;

dimension inspection means being provided on said receiving module and having acceptance and rejection means that are selectively activated responsive to the dimension of the bundle of paper placed at said dimension inspection means; and

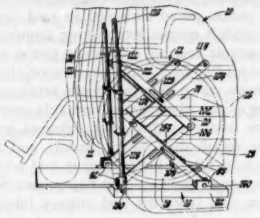
means for transporting accepted bundles of paper from said receiving module to said storage module.

3,912,048
WHEELCHAIR ELEVATOR FOR MOTOR COACH

Donald L. Manning, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 26, 1974, Ser. No. 492,237
Int. Cl.² B60P *1/44*
U.S. Cl. 187—9 R 2 Claims

1. In a coach body having a floor elevated substantially above ground level, a door opening, and a stepwell opening toward the door opening, the combination comprising: a step frame located in the stepwell, linkage means mounting the step frame on the coach body for permitting vertical movement of the step frame and maintaining the step frame in a horizontal attitude, a step plate of substantially greater depth than the step frame and the stepwell, means movably mounting the step plate on the step frame, means for moving the step plate from a normal step forming position in which a portion of the step plate is stored beneath the coach floor to an extended position in which the step plate extends laterally outward of the coach body to increase the exposed depth of the step plate sufficiently to accommodate a wheelchair, and means for selectively effecting vertical movement of the step

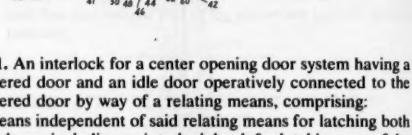


frame and associated step plate between the normal step forming position, a lowered position at ground level and an elevated position at the level of the coach floor.

3,912,049
INTERLOCK FOR CENTER OPENING DOORS

Gordon A. Holland, and Gilbert T. Adams, both of Memphis, Tenn., assignors to Dover Corporation, Memphis, Tenn.

Filed Oct. 26, 1973, Ser. No. 410,201
Int. Cl.² B66B *13/16*
U.S. Cl. 187—61 13 Claims



11. An interlock for a center opening door system having a powered door and an idle door operatively connected to the powered door by way of a relating means, comprising:

means independent of said relating means for latching both doors, including an interlock hook for latching one of the doors,

an interlock switch operated by the interlock hook, and

position responsive means operable as a function of at least the position of the other door to prevent the interlock hook from closing the interlock switch unless both of said doors are closed and latched by said latching means.

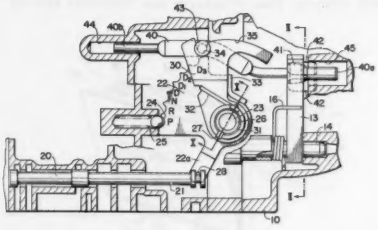
3,912,050
TRANSMISSION PARKING LOCK MECHANISM

Kazuyoshi Iwanaga, Yokosuka; Tamio Kawamoto, Yokohama; Toshiyuki Miyauchi, Yokohama, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 15, 1974, Ser. No. 461,132
Claims priority, application Japan, Apr. 16, 1973, 48-42940
Int. Cl.² B60T *1/00, 1/02*
U.S. Cl. 188—69 5 Claims

1. In a parking lock mechanism for locking the output shaft of a power transmission having a parking gear carried by said output shaft, a toothed parking pawl oscillatably mounted on a portion of a relatively stationary structure of said mechanism and an actuating cam engageablel with said parking pawl in its locking position: the improvement comprising a control rod having one end carrying said actuating cam, the control rod having a curved bent intermediate between two opposite ends thereof to provide two extended, mutually parallel and misaligned portions, said end portions being respectively received in two elongate, misaligned bores formed in said stationary structure in a manner allowing a limited axial movement of the control rod; means for applying force on said control rod to urge said actuating cam into its locking position; an yieldable

lost motion connection between said force applying means and said actuating cam, said force applying means including a manually rotatable shaft, a pin extending from the midpoint of the control rod transversely to the axis thereof, a cam surface engageable with said pin, said pin following the cam



surface upon movement of said cam lever in one direction to move said control rod toward the locking position, and in the opposite direction to move said control rod to an unlocking position at which the control rod is retained by engagement of the pin with the cam surface during further movement of the cam lever in said one direction.

3,912,051
SPOT TYPE DISC BRAKE

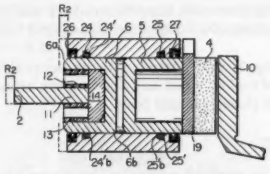
Masatada Yokoi, and Kaoru Tsubouchi, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 2, 1970, Ser. No. 77,625

Claims priority, application Japan, Oct. 8, 1969, 44-96102[U]

Int. Cl. F16d *55/228*

U.S. Cl. 188—72.5 **3 Claims**



1. A spot type disc brake comprising: a body member including a cylinder having a fluid chamber; a first and a second piston slidably reciprocable within said chamber; opposed directly and indirectly operated brake pads slidably supported on said body member and adapted to engage a brake disc; a yoke connecting one of said pistons to said indirectly operated pad, the other piston bearing against said directly operated pad; a pair of sealing rings disposed in said cylinder and projecting into said chamber, one of said rings surrounding and slidably engaging said first piston, and the other ring surrounding and slidably engaging said second piston; each of said pistons having an inner end face and an outer end face, said first piston having an inner end face with a flat rim and an outer end face with a rounded rim, said second piston having a rounded rim on one of its end faces, said pistons being disposed with their inner end faces confronting one another and being insertable into the cylinder from the same side without damage to said rings by the piston rims.

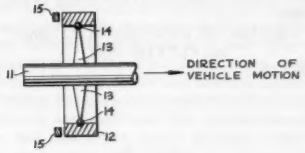
3,912,052
DECELERATION SENSOR FOR ANTI-SKID VEHICLE BRAKES

David Keini, Shikma St. 4, Haifa, Israel (34737), and David W. Pessen, Kadima St. 33, Haifa, Israel (34383)

Filed Oct. 30, 1974, Ser. No. 519,075

Int. Cl.² B60T *8/16*

U.S. Cl. 188—181 A **9 Claims**



1. A deceleration sensor for anti-skid vehicle brakes comprising:

a. a shaft rotating at a velocity proportional to the angular velocity of the vehicle wheel;

b. a rotating mass;

c. resilient means connecting said rotating mass to said shaft so as to permit both relative rotation and relative axial motion between said rotating mass and shaft, and adapted to produce a fixed relationship between said relative rotation and relative axial motion;

said deceleration sensor being mounted in the vehicle at an orientation such that vehicle deceleration produces a relative axial motion between said rotating mass and shaft in a direction opposite to that caused by wheel deceleration.

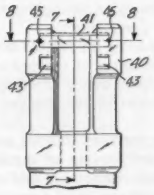
3,912,053
RAILWAY BRAKE BEAM HEAD

Irvin J. Spaeth, Chicago, Ill., assignor to Evans Products Company, Portland, Oreg.

Continuation-in-part of Ser. No. 386,764, Aug. 8, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 526,000

Int. Cl.² F16D *65/06*

U.S. Cl. 188—236 **3 Claims**



1. A railway brake beam head with a pair of transversely spaced toes at at least one end, said toes having faces adapted for selective mounting engagement with the rear face of either a low friction type brake shoe having a rear lug receivable between said toes or a high friction type brake shoe having a similar lug spaced lengthwise of the shoe from the location of the low friction brake shoe lug, and reinforcing crossbar structure between said toes at said one end selectively securable in a permanent manner to said toes, prior to application of a brake shoe, in different locations spaced apart lengthwise of said toes at said one end to accommodate the mounting of a selected one of said types of brake shoes on the head and to prevent the subsequent mounting of the other type of brake shoe on the head by interference with the rear lug of the other type of brake shoe, the toes at said one end having pairs of sockets opening toward each other and spaced apart lengthwise of the toes, said reinforcing crossbar structure comprising

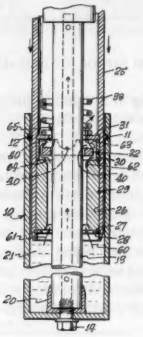
a separately formed crossbar having ends receivable in said sockets, each pair of sockets being adapted alternatively to receive and grip the ends of said separately formed crossbar.

3,912,054

VALVE REPLACEMENT ASSEMBLY FOR MOTORCYCLE FRONT FORKS

Brian K. Fabre, 9447 Haines Canyon, Tujunga, Calif. 91352, and John S. Vander Laan, III, 11509 Bexley Drive, Whittier, Calif. 90606

Filed Nov. 25, 1974, Ser. No. 527,068
Int. Cl.² F16F *9/34*
U.S. Cl. 188—282 **6 Claims**



1. A valve replacement assembly for improving the shock absorbing characteristics of motorcycle front wheel shock absorbers of the type having a stanchion slidable in an oil filled cylindrical slide, a piston mounted on said stanchion and positioned around a hollow damper rod mounted in said slide so that oil may flow through a passage between the rod and the piston, said assembly comprising:

a washer member having an outside diameter about equal to the outside diameter of the piston of the shock absorber, and an inside diameter substantially larger than the outside diameter of the damper rod of said shock absorber;

a thin walled sleeve member abutting said washer member, said sleeve member having an outside diameter about equal to the outside diameter of said washer member and having a height sufficient to fill a space between the upper surface of the piston of the shock absorber and said washer member; and

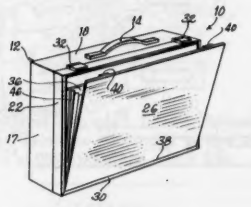
a generally ring-shaped valve means having an inside diameter approximately equal to the outside diameter of the damper rod of the shock absorber, a generally flat bottom surface, a plurality of passageways located above said bottom surface, and sufficient in size and number to permit the flow of oil therethrough without significant pressure drop when said valve is in an installed position above a piston, a top surface configured to cause said bottom surface to be located in a plane parallel to the plane of said washer member when said valve is held against said washer member, the annular space between the bottom surface of said valve and the plane of the bottom surface of said sleeve when said valve and said sleeve are co-axially held against said washer means being the location of maximum pressure drop of oil flow around said valve.

3,912,055

LUGGAGE CASE HAVING HINGED LID WITH AUXILIARY ACCESS DOOR TO FILE COMPARTMENT THEREIN

Robert J. Malooly, 1064 Gage St., Winnetka, Ill. 60093

Filed Mar. 18, 1974, Ser. No. 452,009
Int. Cl.² A45C *3/02*
U.S. Cl. 190—52 **10 Claims**



1. A luggage case,

comprising a box-like body having an end wall and four side walls mounted thereon,

a box-like lid having a first hinge connection to said body for closing said body,

said lid being swingable between open and closed positions relative to said body,

said lid having an end wall member and side wall members mounted thereon,

an access door having a second hinge connection to said lid and constituting at least a portion of said end wall member on said lid,

said door being swingable outwardly from said lid to an open position and being returnable inwardly against said lid to a closed position,

first latch means for disengageably holding said lid closed on said body,

second latch means for disengageably holding said access door closed on said lid,

and a container mounted on the inside of said lid and having an opening accessible from the inside of said lid when said lid is open on said body while said door is closed on said lid,

said opening of said container being accessible from the outside of said lid when said door is open on said lid while said lid is closed on said body.

3,912,056

MEANS FOR INTERLOCKING ACCELERATOR AND PARKING BRAKE CONTROLS

Louis R. Neal, Zion, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 28, 1974, Ser. No. 437,261
Int. Cl.² B60K *29/00*
U.S. Cl. 192—3 T **1 Claim**

1. A parking brake and accelerator interlock system for an operator controlled vehicle having brakes, an adjustable engaging and locking linkage whereby said operator can engage and lock said brake, a power source and a power source control device, said system comprising:

an actuator connecting said adjustable engaging and locking linkage and said brakes;

an accelerator mechanism whereby said operator controls said power source control device, said mechanism comprising;

a pedal control whereby said operator uses his foot to establish the power output level;

a mounting bracket support pivotally supporting said pedal control;

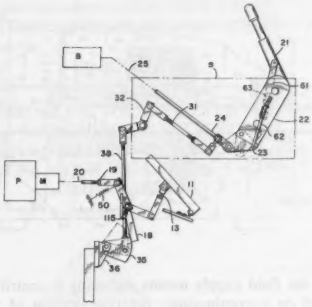
a rockshaft;

an adjustable connector joining said rockshaft and said power source control device;

an adjustable pedal connector fastening said pedal control to said rockshaft;

a rigid member lockout assembly operable in response to actuation of said brakes to positively disrupt the operation of said rockshaft, said assembly comprising;

a lockout bellcrank pivotally mounted in close proximity to said rockshaft and pivotal by said operator from a



free acceleration position to a lockout position, said lockout position positively disrupting the operation of said rockshaft;

an intermediate bellcrank pivotally mounted to transmit said operator's lockout command from said engaging and locking linkage to said lockout bellcrank;

an intermediate adjustor connecting said intermediate bellcrank and said actuator; and

an adjustable lockout pivotally connected to said intermediate bellcrank and said lockout bellcrank.

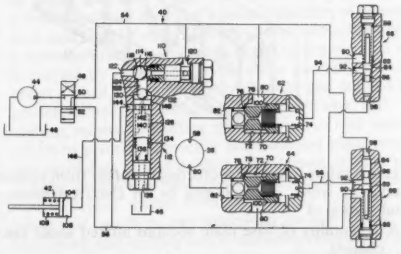
3,912,057
AUTOMATIC BRAKE RELEASE MEANS

Wayne Lauron Krouse, and James Anton Miller, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ind.

Filed May 3, 1974, Ser. No. 466,950

Int. Cl.² B60K *41/26;* **F16D** *67/00;* **B62D** *11/00*

U.S. Cl. 192—4 C **6 Claims**



1. A hydraulic control system for controlling the flow of fluid to and from first and second work ports of a reversible hydraulic drive motor and to and from a piston-containing cylinder of a normally engaged hydraulically releasable brake means adapted for braking a drive including the motor, comprising: a pump and a reservoir connected to a motor control valve means which is in turn connected to said first and second work ports respectively through means of first and second fluid line means; said control valve means being shiftable among neutral, first actuated and second actuated positions for respectively establishing neutral, forward and rearward driving conditions in said motor respectively wherein the first and second work ports are both connected to the reservoir, are respectively connected to the pump and reservoir and are respectively connected to the reservoir and pump; a brake release valve means connected to said first and second fluid line means, to said reservoir and to said cylinder of said brake means and including valve element means shiftable, in response to a first predetermined minimum pressure in either one of said first and second control line means, from a normally closed position wherein the cylinder is connected to said reservoir, to an open position wherein the cylinder is connected to said either one of said first and second fluid line means; said valve element means including means operative once said valve element means is in said open position to maintain said valve element means in its open position as long as the pressure in said one of said first and second fluid line means remains above a second predetermined minimum pressure, which is less than said first predetermined minimum pressure; and said brake means including yieldable means acting against a piston in said cylinder and normally maintaining said brake means in its engaged position but being yieldable in response to said second predetermined minimum pressure acting on said piston to permit the brake means to become disengaged.

3,912,058
HYDRAULIC CLUTCH AND CLUTCH BRAKE OPERATION

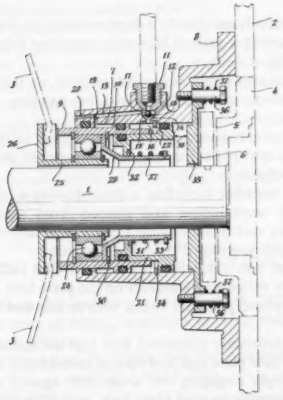
Derek Ray Parkins, Barton-le-Clay, England, assignor to SKF Industrial Trading and Development Company B.V., Jutphaas, Netherlands

Filed May 24, 1973, Ser. No. 363,696

Claims priority, application United Kingdom, May 26, 1972, 25027/72; June 15, 1972, 28103/72

Int. Cl.² F16D *11/06, 13/60;* **B60K** *41/24*

U.S. Cl. 192—18 A **13 Claims**



1. In a clutch withdrawal and clutch brake applying assembly for disengaging clutch drive and driven members and applying a brake means to retard rotation of said driven member, and operable with a source of hydraulic fluid, the assembly comprising, a hydraulic slave cylinder, a slave piston axially movable in said cylinder, a clutch operating member connected to said piston for engaging and disengaging said clutch members upon axial movement of said piston, a second brake operating member for applying said brake means for retarding rotation of the clutch driven member, a first brake operating member axially movable to an actuated position for engagement with said second brake operating member to energize same, means resiliently urging said first brake operating member to a withdrawn position with a lost motion space provided between said withdrawn position and its actuated

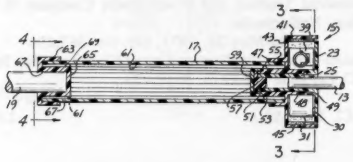
position, means using said hydraulic fluid for applying hydraulic pressure on said piston, with initial axial movement thereof moving said clutch operating member to disengage said clutch members, and further axial movement thereof applying hydraulic pressure on said first brake operating member which moves axially from the withdrawn position to its actuated position for energizing said second brake-operating member, said cylinder and piston having defined between them an annular space operable as a hydraulic compensating chamber for containing hydraulic fluid, where thrust from said further axial movement of said piston is transmitted via said fluid in said chamber to said first brake operating member, and means for flowing hydraulic fluid into said compensating chamber prior to said axial movement of the piston for disengaging the clutch members, for filling said chamber with said fluid even when its volume is increased due to wear of said clutch assembly members, so that with thrust transmitted via the fluid in said chamber, the datum position of the first brake-operating member is maintained constant.

3,912,059

CENTRIFUGAL CLUTCH

Warren H. De Lancey, Elyria, Ohio, assignor to Pioneer Products Company, Elyria, Ohio

Filed Mar. 15, 1974, Ser. No. 451,478
Int. Cl.² F16D *43/14*
U.S. Cl. 192—105 CD **7 Claims**



1. In a centrifugal clutch, a drive member including a circular plate having a central laterally extending hub adapted to receive a drive shaft;

a pair of oppositely arranged weights at their one ends pivoted on said plate, their outer working edges being arcuate;

a spring interconnecting the other ends of said weights;

stops on said plate limiting inward release positioning of said weights;

a driven member including a drum having a friction lining loosely surrounding and spaced from said plate and weights, said drum having a radial wall terminating in an axial hub journalled on said plate hub;

said drum hub extending inwardly of said radial wall into registry with a stop shoulder on the plate hub, and extending outwardly of said radial wall to the end of the plate hub;

a plug frictionally projected into and anchored within the end of said plate hub and having an enlarged radial flange retainingly engaging the drum hub against axial movement relative to said plate hub, said plug closing off the interior of the plate hub, and said plug flange closing off the interior of said drum hub.

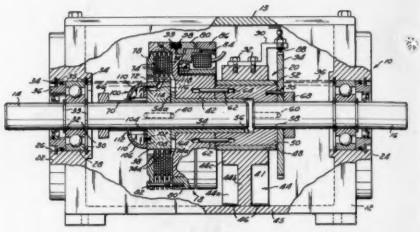
3,912,060

CLUTCH WITH CENTRIFUGAL PUMP

Kenneth E. Handke, 2034 Mayview Ave., Cleveland, Ohio 44109

Continuation of Ser. No. 170,852, Aug. 11, 1971, abandoned.
This application Oct. 23, 1973, Ser. No. 409,020
Int. Cl. F16d *13/72*
U.S. Cl. 192—113 B **14 Claims**

1. A torque transmitting unit of the disc type wherein films of fluid are maintained between adjacent discs for purposes of torque transmission comprising first disc means adapted to be operatively connected to a shaft and second disc means adapted to be operatively connected to an element, closing means for controlling the relative axial proximity of the first and second disc means to thereby control the thickness of fluid films between adjacent disc means and the transmission of torque, and fluid supply means disposed in a sump of fluid such as oil or the like contained within a housing of the torque transmitting unit to continuously deliver fluid to the disc



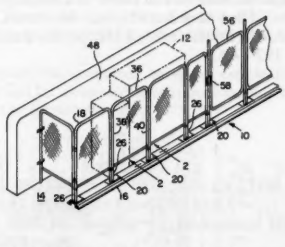
means, the fluid supply means including a centrifugal pump mounted on a continuously rotating portion of the torque transmitting unit disposed within the fluid sump and fluid duct means radially spaced from the shaft for channeling fluid from the pump means to the disc means, one of said disc means being coupled by rows of slidably engaged teeth to said torque transmitting unit and said fluid duct means including a channel portion provided by the removal of at least a major portion of at least one of said rows of engaged teeth.

3,912,061

SAFETY FENCE

Joseph E. Foster, Jr., P.O. Box 262, Exton, Pa. 19341

Filed Oct. 23, 1973, Ser. No. 408,793
Int. Cl. F16P *3/00*
U.S. Cl. 192—133 **11 Claims**



1. In a safety fence for protecting a worker from contacting machinery which is functioned by an electrical motor, the combination of

A. a plurality of base plate sections affixed about the machinery,

1. said base plate sections having an elongated configuration and terminating transversely in a first end and a second end and upwardly in a top surface,

2. said base plate sections being arranged in end to end juxta position about the machinery;

B. support members associated with the base plate sections,

1. each support member including a hollow socket and means to hold the socket in a generally vertical orientation to receive a portion of a fence section therein,

a. each hollow socket terminating upwardly in an open end and downwardly in a bottom end;

C. a plurality of switches secured to the base plate sections in vertical alignment with the support members,

1. each switch including a switch operator and switch contacts,
2. each switch operator projecting upwardly into a hollow socket at the bottom end thereof;

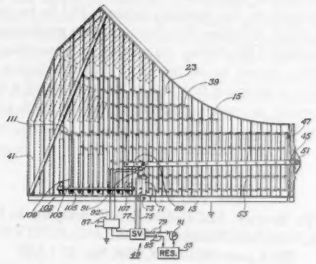
D. a control circuit including circuit wires, the electrical motor and the switches,
1. each said switch being wired into the circuit to control the operation of the electrical motor in response to function of its associated switch operator,

E. and a plurality of fence sections removably attachable to the support members at the sockets thereof,
1. each fence section carrying means to function a switch operator.

3,912,062
SWITCHING MEANS FOR CONVEYOR SYSTEM AND METHOD OF MANUFACTURE

Jesse B. Hutchinson, 4031 Inwood Road, Dallas, Tex. 75209

Filed May 20, 1974, Ser. No. 471,180
Int. Cl.² B65G *13/10*
U.S. Cl. 193—36 **14 Claims**



9. A conveyor switching system for conveying freight or the like from an entering conveyor to a predetermined one of a plurality of exit conveyors disposed at respective predetermined angles in respective directions comprising:

a. a frame with entry and exit ends adapted for juxtaposing in respective end-to-end relationship with an entering conveyor and a plurality of exit conveyors, including one at each said predetermined angle in the desired direction;

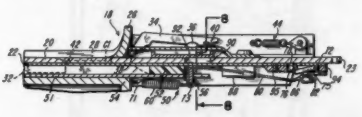
b. a series of units of rollers for support and movement of an article over said frame; said rollers being arranged in a first plurality of rows and a second plurality of columns; each said units of rollers having at least one roller having a common axle axis and being mounted in a member that is carried by said frame so as to be pivotally movable about a pivot axis running therethrough and defined at a predetermined spot with respect to said frame; and

c. shifting means for shifting the axle axes of said units of rollers by pivoting respective said members about respective pivot axes at said predetermined spots so as to control the direction of movement of an article delivered to said switching means from an entering conveyor and cause said article to exit selectively on one of said exit conveyors; said shifting means including respective radial arms rigidly attached to respective units of rollers with free ends extending radially outwardly from said pivotal axes of said units of rollers; and first means for effecting respective amounts of movement of said free ends of said radial arms; said radial arms being attached to said respective units of rollers at respective predetermined attachment angles α with respect to the respective axle axes of said units of rollers such that the length of said radial arm in combination with said respective amounts of movement of said free ends of said radial arms pivot said units of rollers through respective degrees about their respective said pivot axes to effect alignment of the respective axle axis of each said unit rollers with respective lateral straight lines when said system is disposed in a straight ahead position and with respective radials passing from a common center through the respective centers of said units of rollers when said system is disposed in respective switching positions so as to effect different degrees of pivoting of said units of rollers in both said columns and said rows when said units of rollers are pivoted to their said switching positions.

3,912,063
FLOATING CALIPER BLOCK FOR COIN CHUTE

Michell A. Hall, Fort Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed Aug. 2, 1974, Ser. No. 494,225
Int. Cl.² G07F *5/00*
U.S. Cl. 194—92 **27 Claims**



1. In a coin chute of the type which includes a frame; a coin-token receptive slide-plate reciprocably carried by the frame for longitudinal movement from retracted to advanced positions; a slide-plate latch controlling the advanced-position movement of the slide plate; a coin-token gauging member controlling the operational characteristics of said latch; and a latch actuator, wherein:

the coin-token gauging member is disposed in interfering relationship with and is longitudinally movable from a fully retracted position in response to engagement by a coin-token carried by the slide plate;

said latch is pivotally mounted relative to said frame for movement between a normal, slide-plate-locking position and a slide-plate-unlocking position;

the latch actuator is secured to, carried by and projects from the coin-token gauging member, said latch actuator normally and yieldably urging the latch into abutting engagement with a surface of the slide-plate, said actuator also translating selective longitudinal movement of the gauging member to pivotal movement of the latch away from engagement with the aforesaid surface of the slide-plate; and

means normally urging the gauging member to its fully retracted position.

3,912,064
PRINTING APPARATUS WITH FONT ALIGNMENT MEANS

Gary R. Bluem, Minneapolis, and Ronald W. Millman, Bloomington, both of Minn., assignors to Kroy Industries Inc., Minneapolis, Minn.

Filed Jan. 30, 1973, Ser. No. 328,066
Int. Cl.² B41J *1/30*
U.S. Cl. 197—6.7 **7 Claims**

1. A printing apparatus of the type having an image carrier and a color carrier, said printing apparatus comprising:

a printing station;

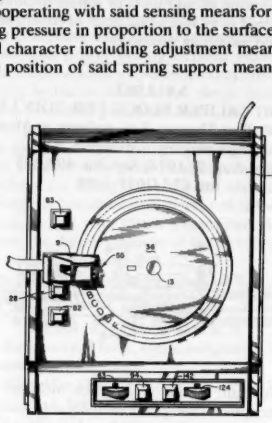
a font having a plurality of raised characters with a plurality of different surface areas, each of said characters selectively positionable in alignment with said printing station to thereby define an aligned character;

means for exerting a printing pressure against said aligned character and said printing station including an adjustable spring support means and a spring means for propelling a piston head toward said aligned character wherein the force propelling said piston head is dependent upon the position of said support means and means for advancing said image carrier relative to said printing station subse-

quent to each transfer of an image of said aligned character to said image carrier;

sensing means cooperating with said font for sensing which of said raised characters is aligned with said printing station;

means cooperating with said sensing means for varying said printing pressure in proportion to the surface area of said aligned character including adjustment means for adjusting the position of said spring support means;



said printing apparatus being further defined in that said font includes a pressure control ring and said sensing means includes a sensing pin cooperating with said adjustment means and adapted for limited movement into engagement with said pressure control ring, the shape and orientation of said pressure control ring beging such that engagement therewith by said sensing pin properly adjusts the position of said spring support means.

3,912,065

PRINTING APPARATUS HAVING AUTOMATIC UNDERLINING WITHOUT BACKSPACING

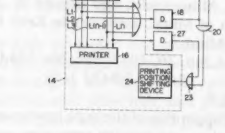
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Higashiyamoto, Japan

Filed Apr. 4, 1974, Ser. No. 457,844

Claims priority, application Japan, Apr. 9, 1973, 48-40231

Int. Cl.² B41J *5/30*

U.S. Cl. 197—19 **6 Claims**



1. A printing apparatus for selectively impressing a special mark such as, for example, a line above or below characters of a word or words consisting of at least one character, comprising:

an input device (**11**) for providing information code signals each corresponding to each of said characters, and function code signals to be located immediately before and after said information code signals for at least one character;

a printing device (**16**) responsive to the information code signals obtained from said input device (**11**) for printing characters;

generating means (**17,18**) coupled to said input device (**11**) for generating a signal representing a printing operation;

a printing position shifting device (**24**) coupled to said input device (**11**) and to said printing device (**16**) for stepping said printing device responsive to said signal representing a printing operation thereof;

memory means (**21**) coupled to said input device (**11**) for memorizing the input state of the function code signal preceding the information code signals for said at least one character and including means for clearing an input state of said function code signal responsive to a further function code signal following said information code signals; and

control means (**20**) coupled to said memory means (**21**), to said generating means (**17,18**) and to said printing position shifting device (**24**) and responsive to said signal representing a printing operation to control the printing device (**16**) during the memorizing period of said memory means (**21**) for selectively causing said printing device (**16**) not to perform a stepping function immediately after its printing operation of each character of said at least one character so as to allow a special mark designated by the function code signal whose input state is memorized by the memory means (**21**) to be printed at least above or below the character just printed, said control means (**20**) being responsive to clearance of said memory means to permit said printing device (**16**) to perform a stepping function after printing of a character responsive to said signal generated by said generating means.

3,912,066

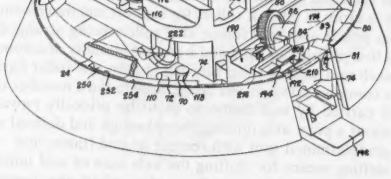
INK PRINTING TOOL

Georg Fritz Bremer, Sao Paulo, Brazil, assignor to Dymo Industries, Inc., San Francisco, Calif.

Filed June 19, 1973, Ser. No. 371,555

Int. Cl.² B41J *1/24*

U.S. Cl. 197—46 **15 Claims**



1. A printing tool for printing selected characters upon an elongate strip of material, said tool comprising:

a frame;

a printing station on the frame;

a plurality of printing means mounted on the frame for movement along a first path of travel passing through the printing station;

carrier means for guiding said strip of material along a second path of travel passing through said printing station and juxtaposed with the first path of travel at the printing station;

selector means for selectively locating any one of the printing means at the printing station;

deflector means on the frame for displacing said one selected printing means out of the first path of travel toward the second path of travel at the printing station;

inking means on the frame for applying ink to said one selected printing means at the printing station; and

operator means on the frame for engaging the strip with the selected printing means at the printing station for printing the selected character upon the strip, the operator means including means for moving the strip out of the second path of travel toward the first path of travel and against the selected printing means at the printing station;

the inking means including ink applying means mounted on the frame for movement in response to the operator means along a third path of travel which intersects the displaced printing means at the printing station and extends beyond the printing station such that movement of the ink applying means along the third path of travel will bring the ink applying means into contact with the displaced printing means;

said operator means further including

an actuator lever mounted upon the frame for movement between a first position, a depressed position, and in intermediate position between a rest position and the depressed position;

means coupling the actuator lever with the ink applying means such that upon movement of the actuator lever from the first position toward the intermediate position the ink applying means will traverse the third path of travel to ink the selected printing means at the printing station and will pass beyond the printing station; and

means coupling the actuator lever with the carrier means such that upon movement of the actuator lever beyond the intermediate position toward the depressed position, the strip will be moved toward the second path of travel and against the selected printing means at the printing station.

3,912,067
TYPEWRITER SPACING SELECTION AND CONTROL MECHANISM

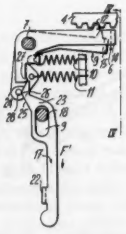
Ulrich Menzi, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Sept. 25, 1974, Ser. No. 509,264

Claims priority, application Switzerland, Sept. 27, 1973, 13830/73

Int. Cl.² B41J 19/44

U.S. Cl. 197—84 R **5 Claims**



1. In a typewriter comprising a carriage mounted for movement along a rack having first and second toothings of different pitch determining different spacing values for step-by-step movement of the carriage under the action of a biasing force, a spacing selection and control mechanism comprising a first pawl able to engage in the first toothing, a second pawl able to engage in the second toothing, means for selectively disengaging either one of the pawls from its toothing, and a single control member controlling release from the rack of whichever pawl is not selectively disengaged.

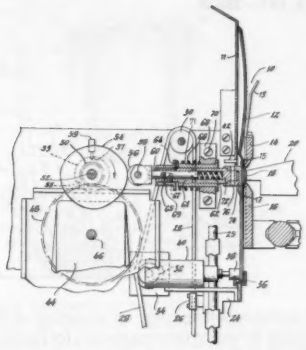
3,912,068
PRINTER HAVING DOCUMENT THICKNESS COMPENSATING DEVICE

Okun Kwan, Trumbull, Conn., and James John Boyce, New York, N.Y., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 249,856, May 3, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 433,096

Int. Cl.² B41J 11/20

U.S. Cl. 197—127 R **17 Claims**



1. A printer for performing print operations on separate, flexible paper-like documents which may be multiple layered and may vary in thickness in accord with the number of layers therein on which different print operations are performed, comprising

a. a document guide means having first and second spaced-apart sides for insertion of said document therebetween;

b. print plane defining means having a pair of substantially flat elongated surfaces which form at least a portion of the first side of said document guide means, said surfaces extending transverse to the direction of document insertion and being in a common plane which is defined as the print plane, and said surfaces being spaced by a predetermined distance to form an elongated opening therebetween;

c. an elongated platen extending the length of said elongated opening and having a flat front printing surface along the length thereof, the width of which is greater than said elongated opening;

d. platen mounting means for mounting said platen adjacent the second side of said document guide means in a position directly opposite said elongated opening on said first side;

e. platen position control means acting upon said platen mounting means for moving said platen between a first position at which it does not interact with a flexible paper-like document in said document guide means and a second position in which the platen clamps and flattens said flexible paper-like document in said document guide means tightly against both of said elongated surfaces, positioning the flattened surface of said flexible paperlike document on which printing is to be performed in said print plane, whereby the printing surface of said document adjacent said elongated opening is precisely positioned and backed by said platen in said print plane;

f. control means coupled to said platen position control means operative to cause said platen position control means to move said platen to said second position only when a print operation is to be performed and to return said platen to said first position when a print operation has been completed; and

g. a short stroke print means mounted for movement along the length of said elongated opening, said print means

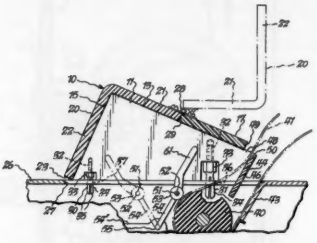
being adapted, during a print operation, to act through said elongated opening to impact and uniformly print indicia on said flexible paper-like document along the length of said elongated opening.

3,912,069

SOUND CONFINING TYPEWRITER COVER

Robert Faulhaber, 642 Aurora St., Lancaster, N.Y. 14086

Filed Aug. 12, 1974, Ser. No. 496,340
Int. Cl.² B41J 29/02
U.S. Cl. 197—186 B **18 Claims**



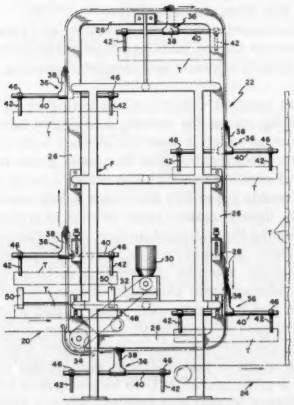
1. A sound-confining cover for mounting on the housing of a typewriter having an opening therein for permitting paper to be supplied to the operating elements of said typewriter and having a bail for holding said paper against the platen of said typewriter and a bail actuating tab coupled to said bail comprising cover means for substantially completely covering said opening and causing said bail and said bail actuating tab to be enclosed within said housing, mounting means for mounting said cover means on said housing, and bail actuating means including a first portion within said cover means for moving said bail toward and away from said platen and a second portion outside of said housing for manual manipulation.

3,912,070

TRAY HANDLING APPARATUS

Vern V. Cronk, Hemlock; John A. Illikman, Saginaw, and Roger J. Gendron, Bridgeport, all of Mich., assignors to Baker Perkins, Inc., Saginaw, Mich.

Filed Apr. 8, 1974, Ser. No. 458,988
Int. Cl.² B65G 59/00
U.S. Cl. 198—35 **3 Claims**



1. In a tray handling apparatus having an infeed conveyor for advancing a stack of trays to a ready position at an unstacking station, a pair of synchronized endless conveyors having parallel first vertical runs extending upwardly on opposite sides of said infeed conveyor at said unstacking station, hook means on said endless conveying means normally biased to a tray engaging position wherein said hook means are operable to support and convey a tray upwardly along said first vertical runs, drive means for synchronously driving said endless conveyors upwardly along said first runs, and first means on said hook means engageable with trays in a stack at said ready position for maintaining said hook means in an inactive position clear of trays in the stack as said hook means move upwardly along said stack until said hook means reaches the uppermost tray in said stack and for then restoring said hook means to said tray engaging positions to operatively engage the uppermost tray in said stack;

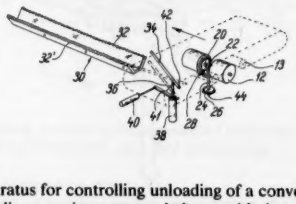
the improvement comprising a pair of vertically elongate gates respectively mounted on each side of said infeed conveyor adjacent the inlet to said unstacking station for pivotal movement about respective vertical axes clear of the path of movement of tray stacks on said infeed conveyor, said gates extending upwardly from said infeed conveyor to a height at least equal to the maximum height of a stack of trays to be handled, bias means normally positioning said gates to a closed position wherein said gates project inwardly over said infeed conveyor into the path of movement of tray stacks on said infeed conveyor, said gates being pivotable outwardly to an open position by the passage of a tray stack therebetween and being returned by said bias means to said closed position when said tray stack arrives at said ready position, and second means on said hook means engageable with said gates when said gates are in their open position for locating said hook means in their inactive position to prevent engagement between said hook means and a stack of trays until the trays are located at said ready position.

3,912,071

CONVEYOR SYSTEM HAVING SELECTIVE LATERAL DELIVERY

Jacob August Nielsen, Viby J., Denmark, assignor to Crisplant A/S, Denmark

Continuation of Ser. No. 336,827, Feb. 28, 1973, abandoned.
This application Sept. 3, 1974, Ser. No. 502,879
Claims priority, application United Kingdom, Feb. 29, 1972, 9351/72
Int. Cl.² B65G 47/46
U.S. Cl. 198—38 **23 Claims**



1. Apparatus for controlling unloading of a conveyor of the type including a main conveyor belt movable in a main conveyor direction and formed of a plurality of interconnected conveyor elements which each have cross conveying means operable to be moved in a transverse direction with respect to said main conveyor direction to effect unloading of articles from the main conveyor belt at at least one unloading station adjacent the travel path of the main conveyor belt; said apparatus comprising:

driving track means arranged along said at least one unloading station,

driving means located on each conveyor element for driving said cross conveying means in said transverse direction, each of said driving means including power transfer means engageable with said driving track means,

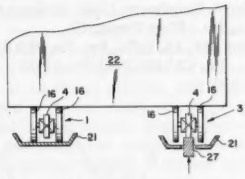
power control means on each conveyor element which is shiftable between an active position providing a driving connection between said rack means and driving means by way of said power transfer means and a passive position providing a disconnection of said driving connection, an actuator means at said at least one unloading station, said actuator means being operable in a non-actuating condition out of operative connection with respective power control means on conveyor elements passing the respective actuator means and an actuating condition in operative connection with a respective power control means of a selected conveyor element passing said actuator means to shift said respective power control means from said passive to said active position,

and retaining means for retaining said power control means of said selected conveyor element, upon movement thereof to said active position, in said active position at least during the passage of the selected conveyor element through the unloading station, independently of the condition of said actuator means.

3,912,072
RADIUS CHAIN CONVEYOR

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Feb. 25, 1974, Ser. No. 445,070
Int. Cl.² B65G *17/00, 19/00*
U.S. Cl. 198—183 **4 Claims**

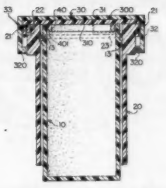


1. A power chain conveyor, comprising: at least two endless chains being mounted so as to be adapted to be driven in respective adjacent endless paths with generally adjacent conveyor runs, each of said endless chains having a plurality of links serially pivotally connected to each other and a plurality of rollers rotatably mounted on said links; track means below the conveyor run of each of said chains to engage and support the adjacent ones of said rollers with rolling contact as said chains are driven; said rollers having their axes of rotation generally horizontal along the conveyor runs; said rollers of each chain extending above the remainder of said chain along the conveyor runs to support a load placed directly on said rollers within the conveyor run opposite from said track means for driving the load at twice the speed of said chains, with rolling contact between said rollers, the load and said track means; the conveyor runs of said chains including an arcuate path in a generally horizontal plane, with one of said chains and its track means being on the outside curve of said arcuate path, and the other of said chains and its track means being on the inside curve of said arcuate path; control means to idle only the rollers of one of said chains while simultaneously maintaining driving contact of the rollers of the other chain track means so the load traveling along the arcuate path on said chains will maintain its orientation with respect to said conveyor runs despite the difference in length of the inside and outside curves of the arcuate path.

3,912,073
SAFETY PILL CONTAINERS

Gerald F. Lewis, 1850 Columbia, Berkley, Mich. 48072

Filed Sept. 3, 1974, Ser. No. 502,801
Int. Cl.² A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **8 Claims**



1. A safety pill container comprising

a. a tubular pill container element having an open top and a closed bottom including a plurality of outwardly disposed nibs spaced around the outer periphery thereof,

b. a sleeve element formed to telescopingly receive said tubular pill container element having an integral outer shoulder formed around the upper outer periphery thereof with a plurality of spaced wells formed in the top of said shoulder and having an inner continuous rib formed around the inner periphery thereof,

c. a cap element mounted in turnable and limited axially movable relationship on said sleeve element disposed over the outer shoulder of said sleeve element,

d. an inner disc pressed fit into said cap element with both the upper surface and outer periphery thereof disposed in firm non-turnable relationship with respect to the inner top and inner periphery of said turnable and axially movable cap element,

e. the inner disc of said cap element having a plurality of depending tabs extending downwardly therefrom registerable with the plurality of wells formed in the top of the outer peripheral shoulder of said sleeve element,

f. the central portion of said inner disc of said cap element having a central annular collar depending therefrom formed to accommodate and receive neatly thereover the upper open end of said pill container element with the annular top thereof disposed in abutment with the said inner disc of said cap element,

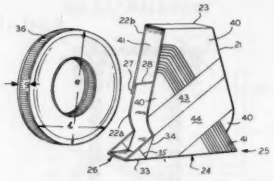
g. the said tubular pill container element being locked within the said sleeve element when pushed upwardly therein from the bottom thereof while manually holding the said sleeve element into a firm position until the nibs of said pill container element snap to a position above the inner continuous annular rib of said sleeve element and the said cap element is turned so that the depending tabs of the cap element are out of alignment with the wells in the top of said sleeve element, and

h. the said tubular pill container element becoming unlocked with respect to the said sleeve element responsive to said cap element being turned so that the depending tabs thereof are positioned in alignment with the wells formed in the top of said sleeve element and the said cap element is pressed axially downwardly with respect to the sleeve element, whereupon said nibs of said pill container element snap below the inner continuous annular rib of said sleeve element and said pill container element becomes free to be manually withdrawn downwardly from said sleeve element.

3,912,074
CARTON FOR AUTOMOBILE AIR FILTER

John W. Vargo, Cleveland, Ohio, assignor to Filter Dynamics International, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 339,121, March 8, 1973, abandoned. This application July 18, 1973, Ser. No. 369,091
Int. Cl.² B65D 5/24, 5/50, 85/02
U.S. Cl. 206—45.14 2 Claims



1. A carton for packaging a cylindrical product having a predetermined circular contour and thickness,

said carton comprising a tube having generally rectangular cross section,

said carton having a front panel, a back panel, a top panel and a bottom panel all integrally hinged together,

said bottom panel being wider than said top panel,

said front and back panels each having a somewhat truncated triangular shape having wider portions at the bottom thereof and narrow portions at the top thereof,

the narrow portions of said front and back panels being equal in width to the top panel,

the distance from the top panel to the bottom panel being substantially equal to the diameter of the cylindrical product,

two locking tab means integrally formed on opposite ends of only the bottom panel,

said tab means comprising a locking member and integrally there with a pair of folding guide members,

said locking member comprising a generally rectangular panel which is serrated at the point of said friction lock, aperture means in said carton at the intersections of the bottom panel, the locking member, the pair of folding guide panels and the front and back panels,

said locking member being an extension of said bottom panel and separated therefrom by a fold line,

said folding guide panels comprising a triangular section joining each of said front and back panels with said bottom panel extension, and

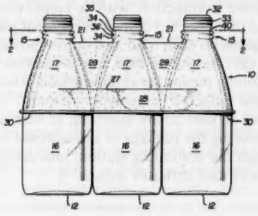
said pair of folding guide panels having a hinge line dividing said guide panels into a pair of right angle triangles, so that when said locking member is folded toward said product said guide panels fold upon each other and upon said locking panel to guide and hold it in an interference friction lock against the contours of the products contained in said carton.

3,912,075
PLASTIC CARRIER FOR CONTAINERS

James W. Berry, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 25, 1973, Ser. No. 382,488
Int. Cl.² B65D 71/00, 85/62
U.S. Cl. 206—158 9 Claims

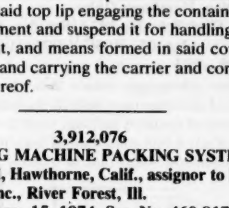
1. A carrier for retaining an array of containers comprised of at least a pair of adjacently positioned containers arranged in upright, side-by-side relationship, comprising a one-piece cover element formed of a thermoplastic material having an endless upright perimeter wall adapted to extend around the array of containers for covering at least a portion of their axial length, individual cell-like compartments defined by a wall extending above and integral with said upright perimeter wall, each compartment being annular and adapted to correspond to and nest over the top of a container of said array, flexible container retaining means comprising a top segment of each said compartment wall encircling the upper part of a container, said encircling top segment wall being axially undulated to define an annular axially compressible and expansible accordion-like segment of said compartment wall terminating in a yieldable top lip and rim on the top of said compartment wall, said accordion-like segment comprising two or more undulated, annular, accordion folds along the wall adjacent said top lip thereof, the rim defining an aperture thereat slightly less in diameter than a top end annular bulged portion of the container, said top lip engaging the container to secure it in said compartment and suspend it for handling support by said cover element, and means formed in said cover element for hand grasping and carrying the carrier and contents in the compartments thereof.



3,912,076
WASHING MACHINE PACKING SYSTEM

Maurice W. Elwell, Hawthorne, Calif., assignor to Iden Manufacturing Co., Inc., River Forest, Ill.

Filed Apr. 15, 1974, Ser. No. 460,817
Int. Cl.² B65D 81/06, 85/00
U.S. Cl. 206—320 7 Claims



1. In a washing machine which includes a housing with an access opening over which a cover is removably disposed, a tub located within said housing and an agitator disposed at substantially the center of said tub, the combination comprising

first and second resilient bracing members each having a downwardly opening recess,

said members being disposed in said access opening in mutually cross-wise relationship with the ends of said members abutting opposite portions of said tub and also abutting said housing at opposite sides of said access opening,

the sides of said recesses respectively abutting the sides of said agitator, and

the central portions of said members being in mutually abutting horizontal relationship with the lower member resting on the top of said agitator and the central portion of the upper member resting on the central portion of said lower member and bulging upwardly above the end portions of said members,

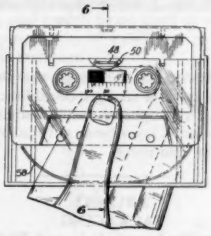
whereby when said cover is in the closed position it compresses said central portions of said brace members against the top of said agitator.

3,912,077

CASSETTE HOLDER

Witold Krynicki, 321 Leroy St., Arcadia, Calif. 91006

Filed Apr. 4, 1973, Ser. No. 347,892
Int. Cl.² B65D 85/672
U.S. Cl. 206—387 1 Claim



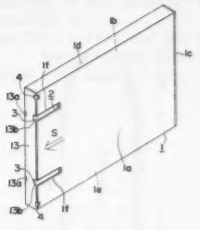
1. A cassette holder comprising a container having an interior space which is of the same general configuration as but somewhat larger than a cassette so that a cassette can be accommodated in said space, said container having an open end through which a cassette can be introduced into and removed from said space and said container being closed at all parts thereof except said open end thereof, a cover having a configuration conforming to said open end of said container, said cover being hingedly connected to said container for turning movement with respect thereto between a closed position covering said open end of said container and an open position uncovering said open end of said container, said cover and container respectively having a pair of wall portions, a catch projection fixedly carried by one of said wall portions, and the other wall portion being formed with a catch recess to receive said catch projection for releasably maintaining said cover in its closed position, said other wall portion which is formed with said catch recess being springy and having a yieldability sufficiently great to permit manual displacement of said other wall portion with said catch recess away from said catch projection to release said cover, while when the latter is turned from said open to said closed position said other wall portion will yield until said catch projection is aligned with said catch recess whereupon said other wall portion will spring back to its initial position for receiving said catch projection in said catch recess, said container having an interior surface opposed to said open end thereof, and spring means situated at said interior surface of said container for displacing a cassette in said container to a position where said cassette is situated partly out of said container extending through said open end thereof when said other wall portion is manually displaced for releasing said cover, so that said spring means will not only displace a cassette to said position located partly out of said container but will also act through said cassette on the cover to swing the latter to its open position, while when a cassette is placed in said container the operator will push the cassette inwardly in opposition to said spring means and will then swing said cover to its closed position where said catch projection is in said recess so that said spring means presses a cassette in said container against said cover while said catch projection and recess hold said cover in said closed position thereof in opposition to the force of said spring means, said open end of said container being of a rectangular configuration and being defined by end edges of a pair of opposed narrow end walls and a pair of opposed longer front and rear walls of said container, said wall portion which is formed with said catch recess being situated at a central region of said front wall, and said cover being hingedly connected to said container for swinging movement with respect thereto about an axis which is situated adjacent and is parallel to said end edge of said rear wall, said cover carrying a cam means for urging a cassette in said container toward said rear wall thereof when said cover is in its closed position, said cam means including a pair of triangular cam projections fixed to said cover equidistantly from said catch projection so that the latter is situated midway between said cam projections, said front wall being formed with a pair of notches extending downwardly from said end edge thereof for receiving said cam projections when said cover is in its closed position.

3,912,078

FILM CASSETTE

Yoshio Asano, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 20, 1973, Ser. No. 426,755
Claims priority, application Japan, Dec. 23, 1972, 48-1417
Int. Cl.² B65D 85/48, 85/38
U.S. Cl. 206—455 9 Claims



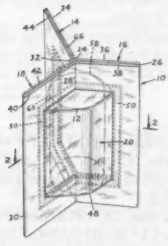
1. A film cassette for insertion within a photographic camera, said film cassette being of rectangular plate-like configuration, formed of lightproof material, and containing a certain number of film monosheets, said cassette comprising: an opening within one end for extrusion of said monosheets from said film cassette and into the body of the camera, lightproof sealing means normally covering said opening, elastic means carried by said cassette for exerting a biasing force on the ends of said monosheets opposite said opening for causing extrusion of said monosheets from said opening past said sealing means and into the camera body, and releasable catch means carried by said cassette and acting on said sheets for restraining sheet movement against said biasing force to normally prevent said sheets from passing through said opening and being released upon insertion of said cassette into said camera.

3,912,079

THREE DIMENSIONAL SHRINK FILM DISPLAY PACKAGE

Donald H. Selchow, Jr., Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,194
Int. Cl.² B65D 73/00
U.S. Cl. 206—463 17 Claims



1. A blank for forming a container, comprising a single rectangular sheet of material such as paperboard having five

parallel and equally spaced score lines formed therein to divide said sheet into six identical panels, said sheet having three identical article-surrounding openings cut out therefrom and centered respectively on the first, third and fifth of said parallel score lines, and article retaining means extending entirely across each of said openings at least in a direction which is normal to said parallel score lines.

3,912,080
CONTAINER OF PLASTIC FOIL

Ragnar O. Winberg, Silvakragatan 87, S-252 57 Helsingborg, Sweden

Filed Sept. 28, 1973, Ser. No. 401,871
Claims priority, application Sweden, Sept. 29, 1972, 12518/72
Int. Cl.² B65D *3/26, 5/70*
U.S. Cl. 206—498 **4 Claims**

1. A container having a thin lining, the container including:
a. a one-piece sheet of which the lining is comprised;
b. a seamless fold in said sheet, said fold being disposed at the upper end of the container and defining first and second halves of said sheet;
c. a discharge opening in the region of said seamless fold;
d. each half of said sheet including a recess therein, each recess extending over a major portion of each half, said recesses of both halves co-operating to define a confined area within the lining;
e. each sheet half including a flange half extending between the associated recess and the outer periphery of that sheet half;
f. said flange halves defining a filling opening;
g. said flange halves being joined together to form a flange about the container and to close said filing opening, said flange lying in a plane in which the center line of the container also lies;
h. the lining including a cylindrical center portion terminating at one end into a convex, dome-shaped bottom portion and at the other end into a top portion;
i. a mechanically stiff sleeve disposed about said center portion and bottom portion of the lining and tightly fitting said center portion;
j. portions of said flange extending along said center portion of said lining being folded over and being compressed between said center portion and said sleeve.

3,912,081
CHILD RESISTANT PACKAGE

Russell R. Haines, Cherry Hill, and Walter Zimmerman, Ocean Gate, both of N.J., assignors to Paco Packaging, Inc., Pennsauken, N.J.

Filed Jan. 23, 1974, Ser. No. 436,021
Int. Cl.² B65D *83/04, 75/42, 85/56*
U.S. Cl. 206—531 **11 Claims**

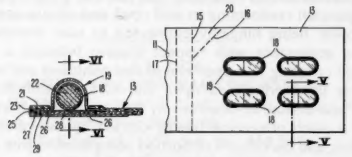
1. A package comprising a laminate of at least three layers with the third layer containing at least one pocket for receiving a product, the seal between the first and second layers of said laminate having a bond strength less than the bond strength of the seal between said second and third layers, said second layer being between said first and third layers, said first

layer being a polymeric plastic having a tear strength substantially greater than the tear strength of said second layer, said third layer having a peripheral notch associated with each pocket, and said second layer being cut transversely adjacent to and spaced from said notch.

3,912,082
PACKAGING

Daniel F. Gerner, Blackwood, N.J., and Richard S. Sauter, Laverock, Pa., assignors to Packaging Coordinators, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 455,616, March 28, 1974. This application Oct. 10, 1974, Ser. No. 513,859
Int. Cl.² B65D *83/04, 75/42, 85/56*
U.S. Cl. 206—531 **10 Claims**



1. In a package with discrete article enclosures, such as a blister card for medicaments or the like in capsule, lozenge, or pill form, including a first strip having a blister-like protrusion formed therein outward from one face and leaving a corresponding hollow and an opening thereinto at the opposite face thereof, a relatively rupturable second strip adherent to the latter face of the first and sealing the opening, a supporting card including a first layer of material juxtaposed to the first face of the first strip and having an opening therein to accommodate the protrusion and including a second layer of material juxtaposed to the first layer and overlying the second strip, the second layer having a perforated access tab in the part thereof opposite the corresponding hollow opening, and a solid film backing overlying and adherent to the perforated part of the second layer and peelable therefrom, the improvement comprising a multiplicity of package portions each so composed and defined relative to one another by perforated lines across the card and by corresponding slits across the backing to unslit margins thereof.

3,912,083
MODULAR STORAGE FRAME FOR FLAT SHEET MATERIALS

Richard S. Jay, Evanston, Ill., assignor to Jarke Corporation, Chicago, Ill.

Filed Aug. 8, 1973, Ser. No. 386,569
Int. Cl.² A47F *7/00*
U.S. Cl. 211—50 **4 Claims**

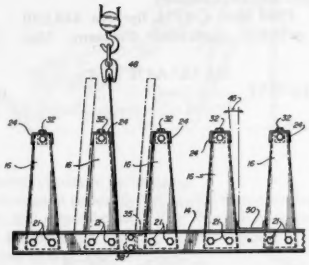
1. A storage frame for flat sheet material comprising, in combination, a pair of base members, said base members being laterally spaced apart a distance and in parallel disposition,
connecting means comprising at least a pair of apertures disposed through each of said opposed ends of each of said base members and a splice plate provided with a

plurality of apertures, thereby to permit the connection of said splice plate to each of said pair of adjacent base members with fastening means,

a plurality of trapezoidal stanchions fixedly mounted on each of said pair of base members and in normal relation thereto, said trapezoidal stanchions fixedly mounted on each of said base members and being positioned in opposed relation with respect to each other,

a channel-shaped trough mounted on and between said base members, said trough being sized to nest within and between opposed pairs of stanchions mounted on said opposed base members,

at least one brace member having one end thereof mounted on one of said base members and an opposed end thereof



mounted on the other of said base members, thereby to support and space said base members in fixed relation,

and a plurality of top rails, each of said top rails being mounted on and interconnecting opposed ones of said trapezoidal stanchions mounted on opposed base members, thereby to support and space said stanchions in spaced and fixed relation

whereby said pair of base members held in supported and spaced relation by at least one of said brace members and having said trapezoidal stanchions mounted thereon, and held in supported and spaced relation by said top rails, form a module storage frame which may be interconnected with additional such modules through said connecting means thereby to form an enlarged storage frame for flat sheet materials.

3,912,084

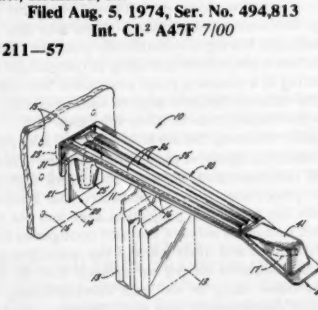
GUARD FOR A HANGER ASSEMBLY

Stanley J. Valiulis, Rockford, Ill., assignor to Southern Imperial, Inc., Rockford, Ill.

Filed Aug. 5, 1974, Ser. No. 494,813

Int. Cl.² A47F *7/00*

U.S. Cl. 211—57 **7 Claims**



1. A hanger assembly having a generally horizontally extending hanger arm and having a pair of horizontally spaced and horizontally extending fingers at the inner end of said arm for attaching the arm to a perforated panel, and a guard for said hanger assembly, said guard comprising an upright sheet formed with a pair of downwardly opening slots sized to slip downwardly over and slidably receive said fingers to attach said guard removably to said hanger assembly, an elongated and generally horizontal strip having its inner end joined to the upper end of said sheet and projecting outwardly from said sheet in overlying relation with said hanger arm, and a tongue on the outer end of said strip and extending in front of said hanger arm to shield the outer end of the arm, said strip being capable of hinging upwardly relative to said sheet to enable said tongue to move upwardly from said hanger arm and permit articles to be hung on or removed from said arm from the outer end thereof.

3,912,085

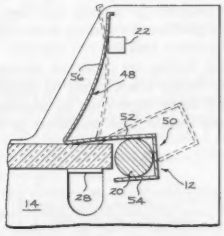
HOUSEHOLD REFRIGERATOR SHELF

Ralph C. Cooke, Louisville, and Jefferson A. McIntyre, Jr., Jeffersontown, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 11, 1974, Ser. No. 513,921

Int. Cl.² F25D *23/00*

U.S. Cl. 211—153 **5 Claims**



1. A household refrigerator shelf, comprising:

a frame having first and second side portions and first and second end portions;

a stop element extending inwardly from one of the frame side portions;

a sheet element having first and second end portions and being positioned between the frame side portions and end portions;

means for supporting the sheet element extending inwardly from the first and second frame side portions;

means for releasably connecting the first end portion of the sheet element to the first end portion of the frame; and

a retaining clip having a channel portion and first and second legs and a flange extending outwardly from one of said legs in contact with the stop element, said retaining clip being releasably positioned over the second end portion of the frame and second end portion of the sheet element for releasably maintaining said sheet element with the frame, said first and second legs of the retaining clip being of dimensions sufficient for causing said legs to deflect outwardly during positioning over and removing the retaining clip from the second end portion of the frame and second end portion of the sheet element.

3,912,086

STORAGE AND DISPLAY OF GOODS

Henri Arnold de Bruyn, Pretoria, South Africa, assignor to Slide-O-Sell (Proprietary) Limited, Pretoria, South Africa

Filed Apr. 26, 1974, Ser. No. 464,608

Claims priority, application South Africa, Apr. 30, 1973, 73/2925

Int. Cl.² A47F *5/00*

U.S. Cl. 211—162 **13 Claims**

1. A storage or display apparatus comprising:

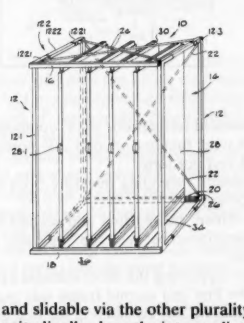
a storage zone;

a plurality of elongated, substantially horizontal telescopically extensible support members arranged side by side in series spaced substantially parallel from one another at a low level in the storage zone, each support member comprising:

a lowermost portion comprising a pedestal and an upwardly projecting rail member, the rail member and pedestal extending along the length of the lowermost portion and the rail member having an upwardly facing track and a downwardly facing track along its length;

an intermediate portion substantially the same length as the lowermost portion and comprising an upper rail member and a lower rail member interconnected in vertically spaced relationship, the upper rail member and the lower rail member of the intermediate portion each extending along the length of the intermediate portion and each having an upwardly facing track and a downwardly facing track along its length, the intermediate portion being supported by a plurality of longitudinally spaced roller members on the lowermost portion and slidable via the roller members longitudinally along the lowermost portion; and

an uppermost portion substantially the same length as the lowermost portion and comprising an upper platform and a downwardly projecting rail member, the rail member and platform extending along the length of the uppermost portion and the rail member of the uppermost portion having an upwardly facing track and a downwardly facing track along its length, the uppermost portion being supported by another plurality of longitudinally spaced roller members on the intermediate portion and slidable via the other plurality of roller members longitudinally along the intermediate portion, the upwardly facing track of the lowermost portion facing the downwardly facing track of the lower rail member of the intermediate portion, and the downwardly facing track of the lowermost portion facing the upwardly facing track of the lower rail member of the intermediate portion, and



the upwardly facing track of the uppermost portion facing the downwardly facing track of the upper rail member of the intermediate portion, and the downwardly facing track of the uppermost portion facing the upwardly facing track of the upper rail member of the intermediate portion, and

each opposed pair of tracks having a longitudinally spaced series of the roller members therebetween;

a plurality of carrier members, one for each support member, each carrier member being fast with and supported by and extending upwardly from one of the support members, the carrier members including display means for mounting goods for display; and

fixedly located guide means engaging each carrier member via a connection comprising a track substantially parallel to the support members;

each carrier member being longitudinally displaceable by hand between a storage position in the storage zone in which its support member is retracted and a display position in a display zone adjacent the storage zone in which its support member is telescopically extended and supports the carrier member cantilever fashion clear of the floor of the display zone, the guide means serving to hold the carrier member upright during said displacement.

3,912,087

MODULAR FRAME ASSEMBLY FOR MAKING FURNITURE SUCH AS TABLES, SHELVES, AND THE LIKE

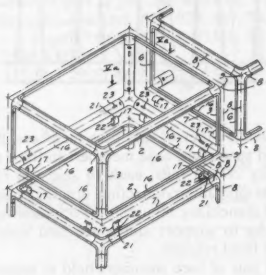
Walter Zeischegg, Ulm, Germany, assignor to Hans Friedrich Hefendahl, Kerspe, Germany

Filed Mar. 4, 1974, Ser. No. 448,030

Claims priority, application Germany, Mar. 2, 1973, 2310583

Int. Cl.² A47F 5/13

U.S. Cl. 211—177 **10 Claims**



1. A frame assembly comprising:

a plurality of post and beam bars of uniform and like cylindrically quarter-segmentally annular cross-sectional shape and size and each having a cylindrically concave outer side centered on a bar axis external of the respective bar and a cylindrically convex inner side;

a plurality of junction pieces each formed with three projections of the same cross-sectional shape and size as said bars and each having a cylindrically concave outer side centered on a projection axis lying perpendicular to and intersecting at a common point external of the respective piece the other projection axes of said respective piece and a cylindrically convex inner side; and

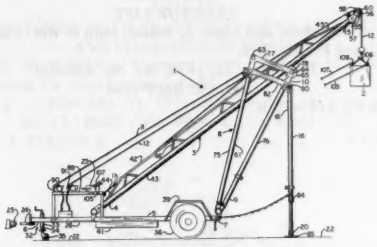
means rigidly securing the ends of each of said post and beam bars to a respective projection to define said assembly with the respective bar axes coincident with the respective projections with the respective bar axes coincident with the respective projection axes and the respective outer and inner sides of the bars contiguous with the respective outer and inner sides of the respective projections, said assembly having an exterior and an interior with the outer sides of the bars corresponding to the exterior of the assembly and with the inner sides of the bars corresponding to the interior of the assembly, all of said axes lying outside said assembly, whereby an assembly of at least one group of four coplanar beam bars, at least one group of four such pieces, and at least four parallel post bars has a generally parallelepipedal shape with said concave faces turned outwardly.

3,912,088

BOOM STRUCTURE

Daniel Bronfman, 4000 E. Red Bridge Road, Kansas City, Mo. 64137

Filed Feb. 28, 1974, Ser. No. 446,639
Int. Cl.² B66C 23/00
U.S. Cl. 212—8 R 8 Claims



1. A boom structure comprising:
a. an elongated generally horizontal frame having opposite sides and opposite ends, said frame having means adjacent the opposite ends thereof for supporting said frame relative to a ground surface;
b. an elongated boom having an upper surface and a lower surface and one end thereof pivotally mounted on said frame, said one end of said boom being positioned intermediate the ends of said frame;
c. an elongated boom support structure having one end thereof pivotally mounted on said frame adjacent one end thereof and the other end adapted to be in supporting engagement with the lower surface of said boom, said one end of said boom support structure being spaced from said one end of said boom, said boom support structure having laterally spaced side frames each positioned on respective opposite sides of said boom and having a lower end thereof pivotally mounted on the one end of said frame adjacent a respective one of the opposite sides thereof, said boom support structure having a wheel rotatably mounted between upper ends of said frames and having a peripheral rim surface in supporting engagement with the lower surface of said boom;
d. an elongated flexible member operatively engaging the other end of said boom support structure and means operatively connected to said flexible member for moving said boom support structure to thereby selectively raise and lower said boom; and
e. a second elongated flexible member extending over the other end of said boom and means operatively connected to said second flexible member for selectively raising and lowering a load,
f. said boom support member further having elongated legs each having and end thereof pivotally mounted on the other end of said boom support member and the other end thereof adapted to be in supporting engagement with the ground surface at a location spaced from the one end of said frame.

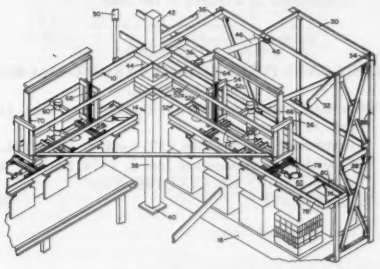
3,912,089

SWING ARM BRICK TRANSFER APPARATUS

Cletus E. Lineberry, Staley, and Jimmy W. Harris, Siler City, both of N.C., assignors to Forrest Paschal Machinery Co., Siler City, N.C.

Filed Apr. 24, 1974, Ser. No. 463,449
Int. Cl.² B65G 47/08
U.S. Cl. 214—1 BC 4 Claims

1. Apparatus for loading and unloading kiln cars, proceeding along dual paths, of the type including
a. a vertical support shaft positioned between said two paths so that kiln cars pass thereby on either side thereof;
b. a pair of horizontally extending support arms fixed perpendicularly with respect to each other and pivotally mounted on said shaft as to simultaneously rotate back and forth about the vertical axis of the shaft in an arcuate path defining a horizontal plane;
c. means for rotating said support arms back and forth in said arcuate path whereby one of said arms is moved from a first position over one of said kiln cars on one side of said shaft to a second position intermediate the two paths of said kiln cars and at the same time the second of said



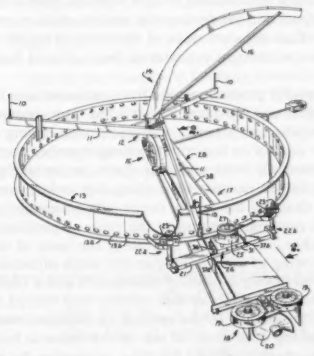
arms is moved from a first position intermediate the two paths of said kiln cars to a second position over another kiln car on the other side of said shaft;
d. a plurality of gripper heads positioned at spaced intervals along each of said arms and means for moving said gripper heads up and down;
e. a means for rotating each of said gripper heads about a vertical axis through an arc of at least 90°; and
f. spreading means associated with each of said support arms for moving said gripper heads with respect to each other whereby the space therebetween is increased to provide clearance between heads for the rotation thereof.

3,912,090

POWER TRAIN FOR A RING-DRIVE SILO UNLOADER

Stan A. Pondell, Fort Atkinson, Wis., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed May 15, 1974, Ser. No. 469,949
Int. Cl.² B65G 65/38
U.S. Cl. 214—17 DB 8 Claims



1. In a silage unloader having a non-rotating frame and a rotating silage gathering means for sweeping around the center of the frame and drawing silage toward the center of the unloader, the combination of a ring drive assembly including

a ring member and a rotatable drive member engaged with the periphery of said ring member and operable to produce relative movement between said drive member and periphery of said ring member,

means connecting one of said members with said non-rotating frame and means connecting the other said member with said gathering means,

the means connecting the drive member to its associated structure including cooperating elements for mounting said drive member to its associated structure for movement of the drive member relative to the associated structure in the form of pivotal motion of said drive member about an axis substantially parallel to the plane of the ring and normal to a radius of the ring.

3,912,091

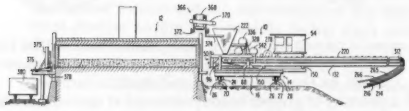
COKE OVEN PUSHING AND CHARGING MACHINE AND METHOD

Buster Ray Thompson, Rte. 1, Lowes Ferry Pike, Louisville, Tenn. 37777

Division of Ser. No. 240,937, April 4, 1972, Pat. No. 3,784,034. This application Jan. 8, 1974, Ser. No. 431,804

Int. Cl.² C10B *31/08*

U.S. Cl. 214—21 **32 Claims**



1. A coke oven pushing and charging machine comprising, in combination, a car supported for movement along tracks extending in front of a bank of coke ovens, oven pushing means and oven charging means supported on said car in side-by-side relation and spaced from one another a distance corresponding to the spacing of adjacent ovens in the bank, said pushing means including elongated pusher arm means supporting a pusher head having a width substantially as great as the width of a coking chamber in said ovens and adapted to be pushed therethrough to push a charge of coke therefrom, said charging means including an endless chain dragtype conveyer having a width substantially as great as the width of said coking chambers and adapted to be projected into said coking chamber in a generally horizontal direction through an open door in the oven, and motor means for driving said pusher arm means into and out of said ovens to push a charge of coke therefrom and for driving said endless chain conveyer into and out of an adjacent oven in the bank of ovens while said car is in a stationary position in front of said bank of ovens.

25. In process for producing coke from carbonaceous material in individual coking ovens constructed and arranged in side-by-side relation in a bank, with each oven having open front and rear ends of its horizontal coking chamber normally closed by removable front and rear doors, respectively, the improvement in the process of pushing hot coke from the ovens and in charging the empty ovens with a new charge of carbonaceous material comprising the steps of positioning a pushing and charging machine in front of the bank of ovens, said machine being of a width to span the width of two ovens in the bank and having a pushing mechanism and a charging mechanism thereon in side-by-side relation and spaced apart a distance corresponding to the spacing of adjacent ovens in said bank, opening both doors of one of the ovens in front of the pushing mechanism of said machine, advancing the pushing mechanism of the machine through said one oven to push the hot coke therefrom, closing the doors of said one oven, advancing the machine along said bank to position said pushing mechanism in front of the next adjacent oven in the bank and the charging mechanism of said one oven, opening the front door only of said one oven, charging the coking chamber of said one oven through said open front door to a substantially uniform depth across the entire width thereof progressively from said front door to the rear door thereof, closing said front door of said one oven, removing both doors of said adjacent oven, and repeating the above steps to push and charge successive ovens in said bank.

3,912,092

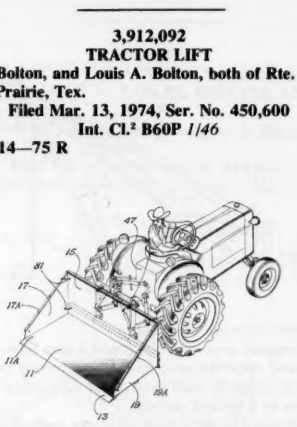
TRACTOR LIFT

Floyd G. Bolton, and Louis A. Bolton, both of Rte. 2 Box 28, Grand Prairie, Tex.

Filed Mar. 13, 1974, Ser. No. 450,600

Int. Cl.² B60P *1/46*

U.S. Cl. 214—75 R **1 Claim**



1. A lift for a tractor having a three-point hitch connected to its rear end and including a central linkage and two spaced linkages, the latter of which are operated by a hydraulic system so as to raise or lower the two spaced linkages, said lift comprising:

a bed having a forward end and a rear end,

said bed having a ramped shaped rear end sloping from the top downward to the bottom side of said bed,

forward end structure extending upward from the forward end of said bed,

side members connected to opposite side edges of said bed and to said forward end structure whereby the tops of said side members slope downwardly from the top of the forward end toward the bed at the rear end of said lift,

a carrier frame comprising two arms having a cross member connected to first ends thereof,

the opposite ends of said arms being pivotally connected to the lower forward end of said lift,

means for connecting said carrier frame to the three-point hitch of the tractor,

means for detachably connecting the upper end of said carrier frame to the upper forward end of said lift to allow said lift to be secured to both the top and bottom ends of said carrier frame or to allow the rear end of said lift to swing downward when the upper forward end of said lift is released from the upper end of said carrier frame,

a blade secured to the lower forward end of said lift and projecting downward below said bed for use for grading purposes,

winch holding means for securing a winch to the forward end of said lift,

a winch,

said winch holding means being adapted to secure the winch on the inside of said lift,

said winch comprising:

a post adapted to be held by said winch holding means in a vertical position,

an arm having a first end pivotally coupled to the upper end of said post and a free end for holding a reel, and means for securing said winch arm in different angular positions relative to said post from a range which extends from a position wherein said winch arm extends upward forming an obtuse angle relative to said post to

a position wherein said winch arm extends downward forming an acute angle relative to said post,

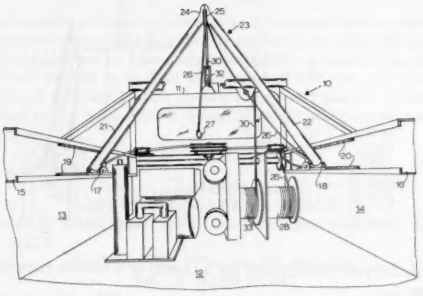
right angled triangular shaped side members adapted to have their sloping edges coupled to the top sloping edges of said first side members to form a box-like lift, and rear gate means adapted to be held by the rear ends of said triangular shaped side members.

3,912,093

HOIST TRUCK WITH PLANETARY GEAR ASSEMBLIES AND LOAD SENSOR MEANS

Melvin W. Kruschke, Fremont, Calif., assignor to Peterson Tractor Co., San Leandro, Calif.

Filed Oct. 11, 1974, Ser. No. 514,184
Int. Cl.² B60P *1/46;* **B66C** *23/00;* **B66D** *1/26*
U.S. Cl. 214—75 H **9 Claims**



1. In a field service truck having a bed to the rear of its cab, a pair of tracks supported at each side of said bed, a boom comprising two converging beams with a hoist pulley at their upper meeting ends, and boom support means pivotally mounted to the lower end of each said beam and mounted on the tracks for movement fore and aft therealong, said bed supporting near said cab: a boom winch having cable means connected to the upper end of said boom, a boom motor operatively connected to said boom winch, a hoist winch having cable means connected over said hoist pulley and having a hoist fixture thereon, a hoist motor operatively connected to said hoist winch, and a travel motor, the improvement comprising:

a common shaft around which said boom winch and hoist winch are journaled for relative rotation and carrying first and second planetary gear assemblies, said common shaft being operatively connected to said travel motor,

said first planetary assembly having a first sun gear secured to said common shaft, a first ring gear driven by said hoist motor, and a first planet gear carrier secured to said hoist winch and carrying a first set of planet gears in mesh with said sun gear and said first ring gear,

said second planetary assembly having a second sun gear secured to said common shaft, a second ring gear driven by said boom motor, and a second planet gear carrier secured to said boom winch and carrying a second set of planet gears in mesh with said second sun gear and said second ring gear,

travel shaft means operatively connected to said boom support means for driving them to move them fore and aft on said tracks, and

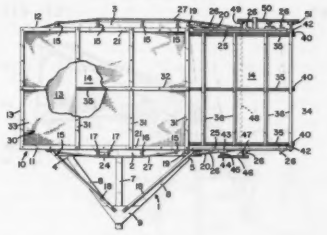
drive transmitting means joining said common shaft to said travel shaft means.

3,912,094

FORAGE COLLECTING AND DISPENSING APPARATUS

Abram P. Balzer, Mountain Lake, Minn. 56159

Filed June 24, 1974, Ser. No. 481,980
Int. Cl.² B60P *1/38*
U.S. Cl. 214—83.36 **1 Claim**



1. A forage collecting and dispensing apparatus comprising:

a. a mobile support frame having opposite sides and including means for connection to a draft vehicle;

b. a receptacle mounted on the support frame for reception of cut crop and comprising:

1. spaced apart generally vertical front and rear walls, elongated in a direction transversely of the direction of movement of the support frame;
2. an end wall connecting the front and rear walls at one end and extending upwardly from one side of the support frame;
3. an elongated bottom wall connecting the front and rear walls and having an inner end adjacent the lower end of said end wall, said bottom wall sloping upwardly and laterally away from said end wall and having an outer discharge end disposed laterally outwardly beyond the other side of said support frame and substantially at a level with the upper end of said end wall;
4. and a generally horizontal open mesh top wall-forming screen extending between said front and rear walls and transversely from the upper end of said end wall toward the outer end of said bottom wall, said screen having an inner end inwardly spaced from said outer discharge end of the bottom wall;
5. said front and rear walls having portions projecting upwardly beyond the level of said screen between the screen and the discharge end of said bottom wall and cooperating with the adjacent portion of the bottom wall to define an open-topped discharge chute;
6. portions of said front wall and said screen cooperating to define a material receiving inlet opening to the interior of the receptacle laterally inwardly of said chute;

c. an endless conveyor extending longitudinally of said bottom wall from said end wall to said outer discharge end and having an upper delivery flight overlying the bottom wall.

d. and means for imparting movement to said conveyor in a direction to move said delivery flight toward said discharge end.

3,912,095

HEAVY-DUTY LOADER FOR QUICK ASSEMBLY ON A TRACTOR

Elmer L. Miller, R.R. No. 2, Larchwood, Iowa 51241

Filed May 31, 1972, Ser. No. 258,462
Int. Cl.² B66F *9/00*
U.S. Cl. 214—131 A **13 Claims**

1. A loader for use with a tractor, comprising:

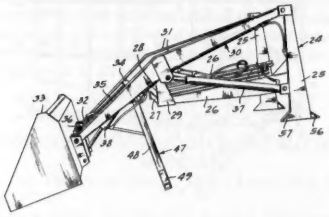
a first frame secured to the tractor;

a second frame adapted to receive the tractor and carry a work implement, said second frame including a pin ex-

tending therefrom, and a cross member adjacent the forward end thereof;

means for releasably attaching said second frame to said first frame to mount the loader on the tractor; and

a detachable stand for placing said first frame in a free-standing position supported by said stand and said work implement, said stand comprising an elongate portion, a



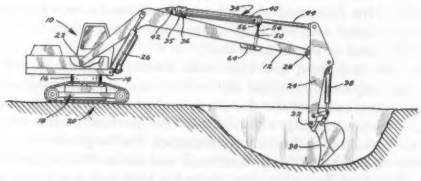
foot portion at one end of said elongate portion, a bore for receiving and pivoting about said pin, and means extending from said elongate portion defining an open clevis for receiving said cross member, said clevis defining means including a first member for limiting movement of said foot portion to positions to the rear of vertical and a second member for limiting movement of said loader with respect to said stand to approximately 15°.

3,912,096

HYDRAULIC SUPPORT FOR CYLINDER OF PISTON CYLINDER MOTOR

Emerl R. Carpenter, Edina, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed June 27, 1974, Ser. No. 483,673
Int. Cl.² E02F *3/32*
U.S. Cl. 214—138 R **8 Claims**



1. In combination with a hydraulic piston-cylinder work motor having a cylinder thereof pivotally mounted with respect to a relatively fixed base, and a piston, piston rod entity operably associated with a work load in such a manner that a piston-cylinder axis of said work motor changes its angular alignment with a longitudinal axis of said base as said work motor is elongated toward its maximum length, the improvement comprising:

A. at least one piston-cylinder booster motor having a piston, piston rod entity and a cylinder entity, the outer ends of such entities being pivotally mounted to support the booster motor with respect to said base to support the rod end of the work motor cylinder;

B. an accumulator hydraulically connected to the booster motor cylinder;

C. compressible energy storage means in a first end of the accumulator;

D. a hydraulic conduit open between a second end of the accumulator and a chamber in the booster motor defined by the booster motor piston, the booster motor cylinder wall, and the closed end of the booster motor cylinder;

E. there being hydraulic fluid filling said closed end booster motor chamber, said conduit, and being in operational, force transmitting relationship to said compressible energy storage means in said accumulator; and

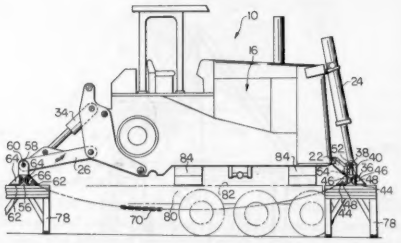
F. means for restricting the rate of flow of hydraulic fluid from said closed end booster motor cylinder chamber to the second end of said accumulator while permitting unrestricted flow of said hydraulic fluid from said second end of said accumulator to said booster motor chamber.

3,912,097

VEHICLE TRANSPORT LOADING AND SERVICING MEANS

Leland D. Turner, East Peoria, Ill., and William H. Zimmerman, Phoenix, Ariz., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Dec. 13, 1974, Ser. No. 532,559
Int. Cl.² B62D *55/06*
U.S. Cl. 214—152 **13 Claims**



1. Support arrangement for a chassis of a vehicle comprising:

first extendable and retractable means mounted to the chassis adjacent one end thereof;

a first generally horizontally disposed beam operably associated with the first extendable and retractable means, and movable relative to chassis upon extension and retraction of the first extendable and retractable means;

second extendable and retractable means mounted to the chassis adjacent the other end thereof;

a second generally horizontally disposed beam operably associated with the second extendable and retractable means and movable relative to the chassis upon extension and retraction of the second extendable and retractable means; and

support means positioned under the first and second beams, the first and second extendable and retractable means being positioned so that actuation of the first extendable and retractable means in one direction and actuation of the second extendable and retractable means in one direction moves the chassis generally vertically in one direction, and actuation of the first extendable and retractable means in the other direction and actuation of the second extendable and retractable means in the other direction moves the chassis generally vertically in the other direction.

3,912,098

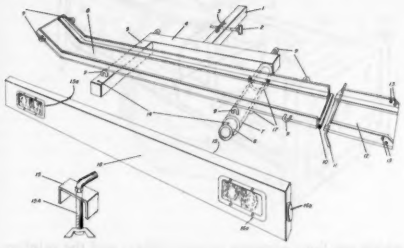
MOTORCYCLE AND CONTAINER CARRIER FOR VEHICLES

William A. Nicotra, 1358 Goettman St., Pittsburgh, Pa. 15212

Filed Jan. 27, 1975, Ser. No. 544,106
Int. Cl.² B60R *9/10*
U.S. Cl. 214—450 **6 Claims**

1. A carrier for supporting an auxiliary vehicle or container on a single hitch of rectangular tubular construction mounted on the rear of a vehicle, said carrier comprising a tubular element of rectangular cross-section adapted to be telescoped

and firmly secured to said single hitch, a cross-beam integrally secured centrally to an end portion of said tubular element, a second tubular element of rectangular cross-section having one end integrally secured to one end of said cross-beam, a pipe having one end integrally secured to the other end of said cross-beam, said second tubular element and pipe extending

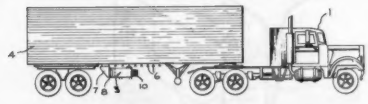


horizontally in the same plane as said cross-beam, and a sleeve journalled about said pipe for pivotal movement about the axis of said pipe, and a base element integrally secured to the top of said pipe so as to pivot on the axis of said pipe, said base element adapted to rest on the top of said second tubular element but being liftable therefrom when said base element is tilted.

3,912,099
SPARE TIRE CARRIER MEANS

Benno E. Liebermann, 2805 Lime Kiln Lane, Louisville, Ky. 40222

Filed June 20, 1974, Ser. No. 481,071
Int. Cl.² B62D *43/04*
U.S. Cl. 214—453 **4 Claims**



1. Spare tire carrier means for a wheeled vehicle comprising:

a. arm means pivotably connected to said vehicle by generally vertical first pivot means disposed such that said arm means can be pivoted thereabout in a generally horizontal plane between a first position adjacent to said vehicle and a second position wherein said arm means extends generally radially outwardly from said vehicle;

b. tire retainer means providing means to secure a selected tire thereto; and

c. generally horizontal second pivot means to pivotably connect said arm means and said tire retainer means such that said tire retainer means can be pivoted thereabout between a first position wherein the central axis of said tire is in a generally vertical disposition and a second position wherein the central axis of said tire means is in a generally horizontal disposition,

d. said tire retainer means comprising:

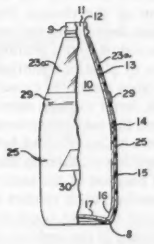
i. frame means including cooperative frame members of selected width defining an enclosure to surround a portion of the periphery of said tire retainer means and terminating at spaced apart wall frame ends to provide a cooperative opening to said enclosure wherein the width of said opening between said frame ends is greater than the diameter of said tire to be received by said enclosure; and

ii. tire fastener means to selectively retain said tire within said enclosure.

3,912,100
COATED GLASS CONTAINER AND METHOD OF MAKING SAME

Paul W. L. Graham, Toledo; Thomas W. Moore, Jr., Perrysburg, and Charles F. Mann, Maumee, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 21, 1973, Ser. No. 372,156
Int. Cl. B65d *11/16*
U.S. Cl. 215—12 **14 Claims**

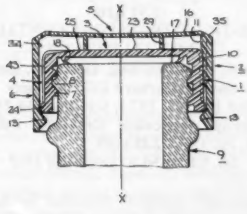


1. An article of manufacture comprising a glass bottle having a body portion and opposed neck and bottom end portions together providing the outside surface area of the bottle, the said neck end portion defining a mouth opening, and plural separate, distinct and different organic plastic cover members snugly engaging adjacent contiguous regions of said surface area of the bottle, said cover members being overlappingly connected to each other on the bottle surface and covering the neck and body areas thereof and at least a portion of its bottom area, said plural cover members overlying each other over at least one portion of the outside area of the bottle, said plural organic plastic cover members comprise a first member formed in situ on the bottle and a second preformed member of contractible plastic material telescopically encircling a portion of the area of the bottle and in shrunken snug engagement thereover, said plastic cover members substantially encapsulating said bottle.

3,912,101
CHILDPROOF CLOSURE

Adrien Patrick Rayner, Huntsmoor Lodge, Iver, Buckinghamshire; Christopher James Niebuhr Tod, 2 Maudlyn House, Steyning, Sussex, and Michael James, 11 Connaught Ave., Shoreham-By-Sea, Sussex, all of England

Filed Sept. 23, 1974, Ser. No. 508,566
Claims priority, application United Kingdom, Mar. 22, 1974, 12957/74; June 28, 1974, 28709/74
Int. Cl.² B65D *55/02*
U.S. Cl. 215—220 **6 Claims**



1. A childproof closure, comprising an inner closure member having a crown and a depending skirt with cam formations for cooperation with complementary cam formations on a container to be closed, and a plastics outer closure member shrouding the inner closure member and having a crown to

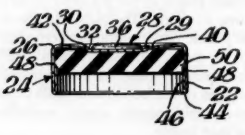
overlie at least part of the crown of the inner closure member and a skirt to overlie the first said skirt, the outer closure member being captive on the inner closure member and being at least in part axially moveable on the inner closure member and biassed to a position in which the outer closure member is freely rotatable on the inner closure member in the sense to disengage the closure from the said container, there being provided means on the inner and outer closure members which are mutually engageable on depression of the outer closure member or the said part thereof against the bias to provide a positive drive between the closure members enabling disengagement of the closure from the container, a plurality of projections formed on the outer periphery of the inner closure member skirt and a plurality of ratchets in the form of thin tongues of plastics material which project integrally and inwardly from the outer closure member skirt into engagement with the inner closure member skirt and which are engageable behind the said projections so as at all times to enable a positive drive to be effected between the members, in the sense to engage the closure on the container and irrespective of the axial position of the outer closure member on the inner closure member, each ratchet being arranged so as to ride resiliently over the said projections when the outer closure member is turned in the sense to disengage the closure from the container.

3,912,102

BOTTLE SEALING CAP

Frank Michel, Brooklyn, N.Y., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,658
Int. Cl.[2] B65D *41/10*
U.S. Cl. 215—249 **10 Claims**



1. A bottle sealing cap comprising an outer cup of thin flexible material having a circular face and a cylindrical skirt attached to it, a removable tab in the central portion of said face leaving an annular outer portion in said face about said tab, said tab having cut edges substantially separating it from the annular outer portion of said face to facilitate removal of said tab from said face, and said outer annular and central portions of said face being concavely indented to withdraw said cut edges behind the contours of said face whereby snagging of said outer edges of different caps disposed adjacent each other is prevented and to permit said face to be flattened outwardly when said cap is crimped upon the top of the bottle whereby removal of said tab is then facilitated.

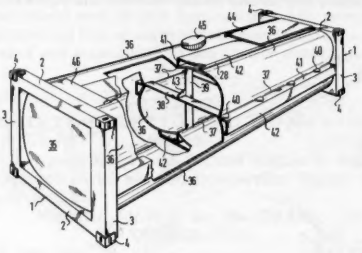
3,912,103

PRESSURE-TIGHT TRANSPORT CONTAINER FOR FLOWABLE GOODS

Helmut Gerhard, Weitefeld, Sieg, Germany, assignor to Westerwalder Eisenwerk Gerhard KG, Germany

Filed Feb. 22, 1973, Ser. No. 334,751
Claims priority, application Germany, Feb. 29, 1972, 2209484; Oct. 30, 1972, 2253235
Int. Cl. B65d *87/00;* **B65j** *1/02*
U.S. Cl. 220—1.5 **25 Claims**

1. A pressure-tight transport container for flowable goods comprising two end walls with corner fittings for stacking and lifting, an envelope having an exterior surface and at least two part-cylindrical wall sections providing a pair of intersection lines extending between the end walls, elongated support members extending between the end walls contiguous to the exterior surface of the envelope, and reinforcing elements arranged inside the container so as to be stressed at least in tension, wherein the improvement comprises each said support member having at least a portion thereof lying substantially in the plane of said pair of intersection lines of the envelope which are lines opposite to each other, and the reinforcing elements comprise elongated members arranged in this plane with the ends thereof penetrating the intersection lines in a fluid-tight manner and rigidly connected to said support members.

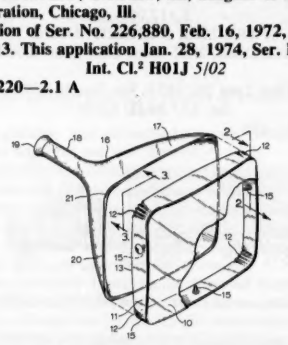


3,912,104

SHEET GLASS COLOR TUBE FACE PANEL WITH PLEATED SKIRT

James W. Schwartz, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 226,880, Feb. 16, 1972, Pat. No. 3,825,413. This application Jan. 28, 1974, Ser. No. 437,097
Int. Cl.[2] H01J *5/02*
U.S. Cl. 220—2.1 A **4 Claims**



1. A color television picture tube envelope comprising a sheet glass panel having a seal edge and a mating funnel having a seal edge adapted to mate with the seal edge of the panel, said panel including a clear faceplate area circumscribed by an upstanding flange, at least portions of said flange having folds which extend axially to the panel seal edge and make sealing engagement with the funnel seal edge.

3,912,105

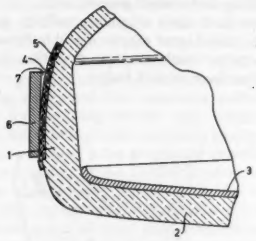
IMPLOSION-FREE PICTURE TUBE

Reinhart Charles Willem Eisses; Hendrik Bongenaar, and Theodorus Cornelis Gerardus Doreleijers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 214,788, Jan. 3, 1972, Pat. No. 3,818,557. This application Mar. 28, 1974, Ser. No. 455,713
Claims priority, application Netherlands, Jan. 8, 1971, 7100273
Int. Cl.[2] H01J *9/18, 29/02, 61/30;* **B65D** *85/70*
U.S. Cl. 220—2.1 A **3 Claims**

1. An implosion protected picture tube having a glass envelope including a screen and a funnel-like wall, comprising: an adhesive tape surrounding a peripheral portion of said wall, a

metal clamping band tightly surrounding said tape, and a reinforcement fabric embedded within said tape and including a plurality of parallel fibres extending substantially in the



longitudinal direction of the tape, said fibres contacting both the envelope and metal band to increase friction therebetween.

3,912,106
OUTLET FOR SUB-FLOOR AND CONCEALED INSTALLATIONS

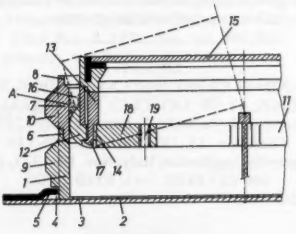
Hans-Martin Traupe, Frenssenstrasse 51, 2 Hamburg 55, Germany

Filed July 9, 1973, Ser. No. 377,740

Claims priority, application Germany, July 7, 1972, 2233450

Int. Cl.² H02G *3/08*

U.S. Cl. 220—3.4 **9 Claims**



1. A box member for connection to a tubular body which is to be encased in floor or wall material such as concrete or plaster; said box member forming an outlet from said body for wires or the like, said box member having an end wall for engagement with the tubular body and cylindrical side wall means connected to the end wall and extending therefrom toward the plane of the surface of the material in which the tubular body will be encased, said side wall means at the end opposite said end wall forming an open end on the box member, and a tubular insert of work material receivable in the open end of said box member and having a radially outwardly projecting peripheral bead of work material on said insert below the top of said insert, means forming an annular space between said side wall means of the box member and said tubular insert above said bead, said tubular insert being smaller in diameter than said cylindrical side wall means and said bead forming the sole region of engagement of said tubular insert with said side wall means and said bead permitting tilting of the tubular insert in any direction in the box member.

3,912,107
MOBILE LIQUID STORAGE TANKS

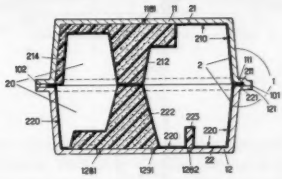
Bernard Baumann, Paris, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, France

Division of Ser. No. 246,856, April 24, 1972, Pat. No. 3,811,173. This application Oct. 9, 1973, Ser. No. 404,495

Claims priority, application France, Apr. 26, 1971, 71.14842

Int. Cl.² B65D *25/18, 81/02*

U.S. Cl. 220—9 F **12 Claims**



1. A mobile tank for liquids comprising an outer metal wall having an inner surface defining a substantially closed container, an inner wall formed of a plastic material, with the inner wall having a portion corresponding to the inner surface of the outer wall and a portion defining at least one stabilizing baffle and with the portion of the inner wall being in surface contact with the inner surface of the outer wall whereby the portion of the inner wall defining the baffle forms a substantially closed space with the inner surface of the outer wall, and a core of a foamed plastic substantially filling this closed space.

3,912,108
AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

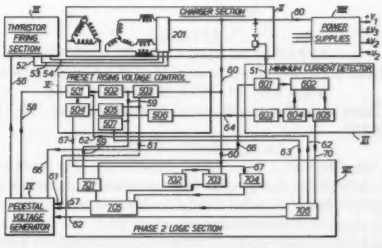
Dennis Albert Clayton, Gawsworth, and George William Foster, Bolton, both of England, assignors to Chloride Legg Limited, Wolverhampton, England

Filed July 9, 1974, Ser. No. 486,847

Claims priority, application United Kingdom, Sept. 7, 1973, 32572/73

Int. Cl.² H02J *7/04*

U.S. Cl. 320–39 **22 Claims**

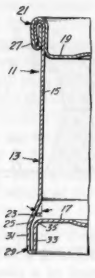


1. Automatic charging apparatus for charging discharged electric batteries, comprising means for establishing a reference voltage, a comparator for comparing the battery voltage with the reference voltage, means for automatically adjusting the charging current during at least a phase of the charge to bring the battery voltage closer to the reference voltage, and means for progressively increasing the reference voltage, at either of two different rates, the said means being controlled by the comparator to select a higher rate when the battery voltage exceeds the reference voltage and a lower rate when the battery voltage is less than the reference voltage.

3,912,109
METAL CONTAINER AND METHOD FOR MAKING SAME

Frederick William Essex, Jr., Scotch Plains, and Max Elliot Pippitt, Kinnelon, both of N.J., assignors to American Can Company, Greenwich, Conn.

Filed Nov. 15, 1973, Ser. No. 416,091
Int. Cl.² B65D *17/02, 17/08*
U.S. Cl. 220—66 **3 Claims**



1. In an improved two-piece metal can having a seamless, container body of circular cross-section provided with integral side and bottom walls, a circular closure adapted to be joined to said side-wall by an annular double seam having five adjacent layers of metal,

the improvement wherein the profile of the area adjacent both said side and bottom wall includes:

a shoulder extending outwardly from the bottom portions of said side-wall at an angle of about 25° to the plane of said side-wall for a distance such that the maximum outside diameter of said shoulder is substantially equal to the maximum outside diameter of said double seam, and

a flange extending from the bottom of said shoulder substantially parallel to the plane of said side-wall

said flange having both a first segment extending downwardly for a distance about equal to the length of said double seam and a second substantially linear segment doubled back on and within said first segment,

said bottom wall being substantially planar and having a curved periphery joining the second linear segment of said flange to said bottom wall in a substantially perpendicular plane.

3,912,110
APPARATUS FOR CLOSING DRUMS

Wilhelm Hammes, Hauptstrasse 38, 5203 Much, Germany

Filed May 21, 1973, Ser. No. 362,316
Claims priority, application Germany, May 30, 1972, 2226217
Int. Cl.² B65D *39/00, 7/42*
U.S. Cl. 220—67 **7 Claims**

1. A drum of the type having a plastic body portion and a separate plastic closure firmly seated within an end of the body portion, the improvement wherein:

said plastic body portion has an end which defines a groove-like border including:

an inwardly projecting circumferential bead-like bulge,

said bulge defining a generally radially inwardly projecting annular gripping recess;

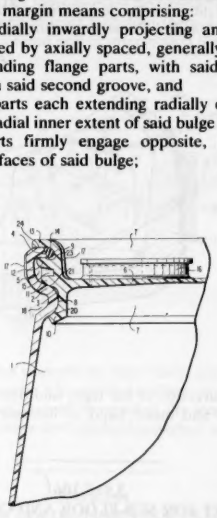
an inwardly bent circumferential lip located outwardly of said bulge relative to a longitudinal axis of the drum, and

an intermediate section extending between said bulge and said lip and defining a generally radially outwardly projecting annular first groove; and

said plastic closure having circumferential margin means firmly anchored within said groove-like border of said body portion to seal and resist distortion of the latter while preventing removal of said closure from said body portion, said margin means comprising:

a generally radially inwardly projecting annular second groove defined by axially spaced, generally radially outwardly extending flange parts, with said bulge being seated within said second groove, and

said flange parts each extending radially outwardly beyond the radial inner extent of said bulge such that said flange parts firmly engage opposite, longitudinally spaced surfaces of said bulge;



a generally radially inwardly projecting annular third groove located outwardly of said second groove relative to a longitudinal axis of the drum, said third groove being defined by axially spaced, generally radially outwardly extending flange parts, with said lip being firmly seated in said third groove;

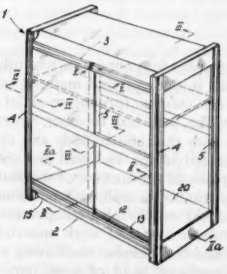
said last-named flange parts each extending radially outwardly beyond the radial inner extent of said lip such that said last-named flange parts firmly engage opposite, longitudinally spaced surfaces of said lip;

said first groove of said body portion being configured to receive at least one of said flange parts.

3,912,111
COMPOUNDABLE UNIT DISPLAY WINDOW FOR THE DISPLAY OF ARTICLES IN GENERAL

Claudio Marengoni, via Italia 7, Brescia, Italy (25100)

Filed Nov. 13, 1972, Ser. No. 306,110
Claims priority, application Italy, Nov. 19, 1971, 31397/71
Int. Cl.² B65D *7/42;* **F16B** *12/00*
U.S. Cl. 220—84 **2 Claims**



1. A display window with a longitudinal and a transverse dimension for articles in general, comprising a supporting structure consisting essentially of a parallelepiped framework, having a plurality of uprights, a base element and an upper cover element, joined together and stiffened by said plurality of uprights, and wherein said base element and said cover element comprise each a tubular frame having a rectangular

configuration with a longer and a shorter side and with dimensions corresponding to said transverse and said longitudinal dimensions of the display window, an arcuate section partially surrounding externally each longer side of said tubular frame, said arcuate section including a curved part shaped as a quarter of circumference, said curved part having a first end portion extending in a substantially vertical direction and inwardly offset with respect to said longer side, and a second end portion extending in a substantially horizontal direction close to said longer side of the tubular frame, said second end portion having a channel-like extension defining a recess therebetween for receiving therein said longer side of the tubular frame, said channel-like extension having an inwardly facing vertical wall with a fin projecting therefrom for supporting a plate member of the display window, said channel-like extension also defining horizontal guides and counter-guides for sliding engagement with window panels, said base element and said cover element each comprising further lateral box sections connected to and coextensive with said shorter sides of the tubular frame, said lateral box-sections having each a substantially horizontal wall defining horizontally extending seats offset thereto for receiving display window panels, said uprights consisting of vertically extending sections having vertical side walls defining a pair of inwardly facing vertically extending coupled guides, one of said coupled guides cooperating with said horizontally extending seats for receiving and holding a display window panel, and the other of said vertically extending coupled guides having means for receiving removable shelf supporting pegs, said channel like extension and said vertically extending sections having outside walls with external projections defining seats for removably receiving therein cover plate like elements.

3,912,112
DEVICE FOR DAMPING THE VIBRATIONS OF BELLOWS, PARTICULARLY OF STORAGE BELLOWS FOR LIQUID PROPELLANTS FOR ROCKET ENGINES

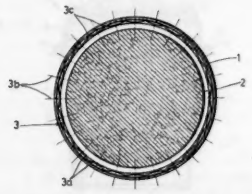
Helmut Frankle, Heilbronn-Neckargartach, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Germany

Filed Feb. 6, 1974, Ser. No. 440,262

Claims priority, application Germany, Feb. 10, 1973, 2306571

Int. Cl.² B65D *25/00*

U.S. Cl. 220—85 B **6 Claims**



1. A device for damping the vibrations of bellows, particularly of storage bellows for liquid rocket propellants, comprising a bellows, a damping jacket enclosing the bellows and comprising a plurality of circumferential adjacent segmental portions fixed between said bellows and said jacket and each being arched radially inwardly and having crest areas in biased engagement with said bellows.

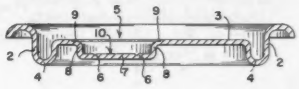
3,912,113
COINED END PANEL

Harry A. Peyser, Olympia Fields, and Edward J. Herbst, Posen, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 521,996

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **7 Claims**



1. In a non-detachable end closure for a container, comprising an end panel including a ledge, said end panel being formed with a well having a wall in an area between the center of the end panel and said ledge, said well having at its base a partial score and an opening flap partially encircled thereby: the improvement comprising a distortion-inhibiting coined area in the panel encompassing said well.

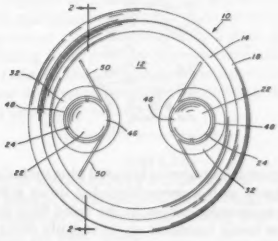
3,912,114
DIGITALLY OPENABLE CONTAINER CLOSURE

James R. Morran, Apollo, and Charles L. Jordan, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 12, 1973, Ser. No. 405,803

Int. Cl.² B65D *39/00, 47/02, 49/00*

U.S. Cl. 220—268 **6 Claims**

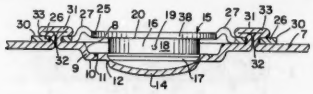


1. A sheet metal container component having a generally planar wall with at least one relatively rigid inwardly displaceable opening panel in said wall bounded in substantial part by a fracturable web defining a locus of separation of said opening panel from the adjacent portion of said wall, an integral deflectable portion projecting outwardly from said container component adjacent said fracturable web in surrounding relation with said opening panel and relatively easily deflected in comparison with the opening panel and at least one weakening line in said wall adjacent said opening panel and extending across at least a portion of said wall on the side of the opening panel toward the center of said wall and ends thereof extending in generally opposite directions toward the peripheral edge of the wall to facilitate displacement of said deflectable portion and said wall in response to digitally applied inwardly directed pressure to strain said web and initiate fracture thereof to permit inward displacement of a separated opening panel.

3,912,115
DOUBLE TETHERED PUSH-IN TAB

David R. Smith, Barrington, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,265
Int. Cl.² B65D *41/02*
U.S. Cl. 220—277 14 Claims

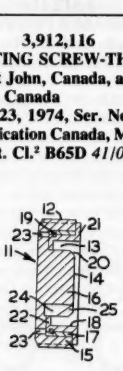


1. A container comprising:
container component means including a surface;
flap means adapted for removal from closure relationship with a portion of said surface to present an opening therethrough;
means operatively associated with said flap means for applying force to said flap means for accomplishing removal of said flap means from said closure relationship; and
plural independent retaining means operatively associated with said force applying means to retain said force applying means in permanently attached relation to at least one of said component and flap means.

3,912,116
TAMPER-RESISTING SCREW-THREADED PLUG

William Chahley, Saint John, Canada, assignor to Wm. Chahley Ltd., Saint John, Canada

Filed Aug. 23, 1974, Ser. No. 499,943
Claims priority, application Canada, Mar. 27, 1974, 196136
Int. Cl.² B65D *41/04*
U.S. Cl. 220—288 6 Claims



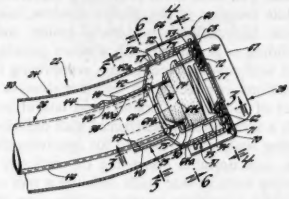
1. A tamper-resisting screw-threaded plug including a cylindrical main body with a screw-threaded outer side wall, the body having an annular recess in the front face thereof, the annular recess being bounded on its radially outer side by a peripheral wall of the main body and on its radially inner side by a central hub of the main body, the hub being shaped for engagement by a correct tool of predetermined shape to enable the plug to be rotated by the tool, the plug also including a sleeve secured in the recess adjacent the peripheral wall of the main body so as to be rotatable relative thereto, the sleeve being radially spaced from the central hub to enable the tool to be engaged therewith, the sleeve having an outwardly directed annular flange extending over a front face of the peripheral wall of the main body to prevent engagement of said front face by an incorrect tool.

3,912,117
FUEL TANK EXTENDABLE FILLER NECK ASSEMBLY

Thomas C. Ryding, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1974, Ser. No. 518,819
Int. Cl.² B65D *41/06*, *51/16*; B65B *3/04*
U.S. Cl. 220—293 2 Claims

1. An extendable filler neck assembly for a vehicle fuel tank including a cylindrical main filler neck having a lower end adapted for attachment to a fuel tank, and an upper end adapted to receive a filler cap, said upper end including a sealing edge and diametrically opposed cam means with cap withdrawal slots therein, a centrally apertured, guide means fixed within said main filler neck closely adjacent to said upper end, a cylindrical extension filler neck slidably mounted in said guide means and telescopically received within said main filler neck, said extension filler neck having means cooperating with said guide means to limit its axial movement between an extended position and a retracted position relative to said main filler neck and to prevent rotation of said extension filler neck relative to said main filler neck, said extension filler neck having diametrically opposed radially outward



extending retainer tabs at its upper end and, a filler cap, said filler cap including a cover member and a cup member carried by said cover member which is axially receivable in said upper end of said main filler neck, said filler cap further including a valving assembly having one end slidably received in said cup member and having a reduced diameter pilot portion at its opposite end extending axially outward from said cup member to be slidably receivable in said extension filler neck, a retainer washer encircling said pilot portion, said cup member having a pair of opposed outward projecting locking tabs and a pair of opposed inwardly projecting locking flanges axially spaced from said lock tab and spring means positioned in said cup member to normally bias said retainer washer into engagement with said locking flanges.

3,912,118
CONTAINER LID

Stanford W. Bird, 745 three Fountains Circle, Salt Lake City, Utah 84107

Filed Mar. 22, 1973, Ser. No. 343,902
Int. Cl.² B65D *51/16*, *43/10*, *41/16*
U.S. Cl. 220—306 3 Claims

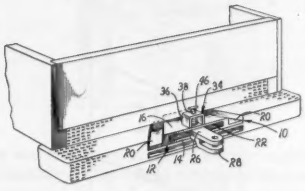
1. A one-piece lid for a container comprising
a flat base surface;
a wall flaring outwardly from said flat base portion whereby said flat base portion and said wall form a dish, said wall terminating in an inner bead and an outer flange spaced from, but connected to said bead;
elongate projections spaced around the outer flange and projecting inwardly therefrom;
spaced bosses formed in the flat base portion and projecting therefrom into the dish formed by the flat base portion and the wall; and

unobstructed openings through the bosses a spaced distance above the flat base portion when the lid has the wall extending upwardly such that the lid forms a dish.

3,912,119
TRAILER HITCH

Wayland W. Hill, P.O. Box 168, Earlimart, Calif. 93319, and Gary Lee Hill, 1408 Demare St., Visalia, Calif. 93277

Filed Jan. 31, 1975, Ser. No. 545,815
Int. Cl.² B60D 1/16
U.S. Cl. 280—478 A **9 Claims**



2. An improved trailer hitch comprising:

A. a housing including a base plate and a top plate disposed in spaced parallelism with said base plate;

B. a telescopic drawbar assembly projected from said housing including a sleeve and a concentrically related link supported for pivotal displacement about an axis passing through one end thereof and axial displacement between extended and retracted positions relative to said housing;

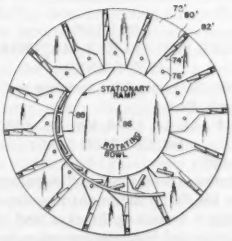
C. first motion arresting means connected to said drawbar assembly for releasably securing said assembly to said base plate for supporting said link against pivotal displacement including a spring-biased locking pin mounted on said assembly; and

D. second motion arresting means mounted on said drawbar assembly for releasably securing said link in a retracted position relative to said base plate.

3,912,120
CENTRIFUGAL METHOD OF SORTING AND ORIENTING PARTICULATE ARTICLES

Kurt H. Hoppmann, Falls Church, Va.; George W. Edmunds, Derwood, Md., and Horst A. Schober, Falls Church, Va., assignors to Hoppmann Corporation, Springfield, Va.

Continuation-in-part of Ser. No. 344,696, March 26, 1973, Pat. No. 3,831,734. This application Aug. 26, 1974, Ser. No. 500,835
Int. Cl.² B07C 9/00
U.S. Cl. 221—7 **21 Claims**



1. Centrifugal method of sorting and orienting particulate articles comprising:

A. randomly discharging said articles into a plurality of radially aligned downwardly inclined channels defined within a rotating outer rim;

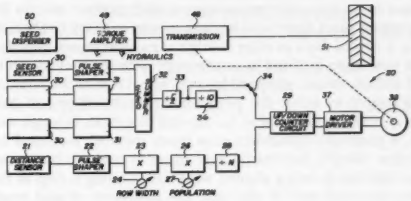
B. imposing a vertical restraint so as to align said articles with respect to said channels; and,

C. dropping while rotating said articles into the desired orientation within each said channel.

3,912,121
CONTROLLED POPULATION MONITOR

Ronald W. Steffen, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Aug. 14, 1974, Ser. No. 497,221
Int. Cl.² A01C 7/18
U.S. Cl. 221—13 **18 Claims**

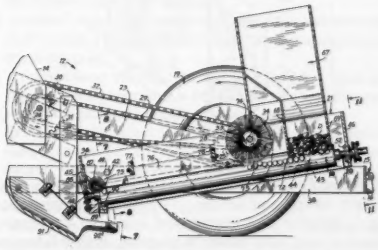


1. A controlled population monitor for determining the number of seeds delivered to the ground from seed planting apparatus having a hopper for carrying seeds to be planted, seed dispensing means associated with the hopper for planting seeds in a plurality of spaced rows as the planting apparatus is transported over the ground and variable speed drive means coupled to said seed dispensing means for changing the rate at which seeds are dispensed; said monitor comprising seed sensor means mountable for association with said seed dispenser means for producing a first group of pulses which correspond in number substantially to the number of seeds actually dispensed by said seed dispensing means, distance-measuring means for producing a second group of pulses, each pulse of which corresponds to a predetermined increment of distance traveled by said planter apparatus over the ground, row width multiplier means responsive to each pulse of said second group of pulses for producing a third group of pulses corresponding in number to a predetermined increment of distance between the rows, and means responsive to said first, second and third groups of pulses to provide a signal to control said seed dispensing means.

3,912,122
HIGH RELIABILITY PLANTER APPARATUS

Philip B. Knapp, Lynbrook, and Jon R. Zogg, Baldwin, both of N.Y., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 26, 1973, Ser. No. 401,104
Int. Cl.² A01C 7/04
U.S. Cl. 221—162 **10 Claims**



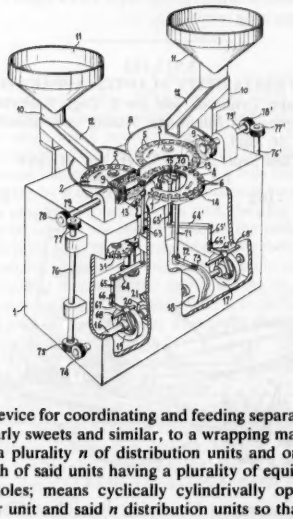
1. Planter apparatus for sowing discs of readily crushed material, such as environmental seed cells, at accurately

spaced intervals, comprising, in combination, a chassis, wheel means rotatably mounted on said planter engaging the ground for rotation responsive to translatory movement of said planter along the ground, hopper means mounted on said chassis for receiving a bulk supply of said discs, a pair of elongated, cylindrical distributor rollers mounted on said chassis with their axes in parallel spaced relation, said rollers being disposed side by side, the spaced portions of the peripheries of said rollers defining therebetween an elongated vertically open slot, the transverse dimension of said slot being smaller than the height of said discs, said rollers having their axes inclined to the horizontal, the space above the upper inclined end of said rollers defining a receiver station and the lower end of said rollers defining a discharge station, exit means in said hopper means above said receiver station for depositing discs from said hopper means onto said rollers to form a row of discs in edge to edge alignment above said slot, said row being inclined in accordance with the inclination of said rollers, means powered by said wheel means for rotating said rollers to move the peripheral portion of one of said rollers defining said slot in an upward direction, through said slot, a generally cylindrical stop brush member mounted for rotation about a horizontal axis adjacent said discharge station, said brush being aligned with and forming a stop at the lower terminal end of said slot, the periphery of said brush being in wiping engagement with the lower end portions of said rollers, whereby said brush is rotated about said axis responsive to the rotary movement of said rollers, and release means at said discharge station operatively connected with at least one of said rollers for discharging the lead disc in said row in timed relation to the rotation of said rollers.

3,912,123
DEVICE FOR COORDINATING AND FEEDING SEPARATELY OBJECTS, PARTICULARLY SWEETS AND SIMILAR, TO A WRAPPING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli, Italy

Filed Jan. 2, 1974, Ser. No. 430,144
Claims priority, application Italy, May 9, 1973, 3398/73
Int. Cl. B65g *47/26*
U.S. Cl. 221—237 **3 Claims**

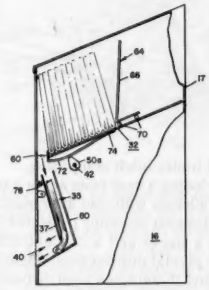


1. A device for coordinating and feeding separately objects, particularly sweets and similar, to a wrapping machine, comprising: a plurality *n* of distribution units and one conveyor unit, each of said units having a plurality of equidistant peripheric holes; means cyclically cylindrivally operating said conveyor unit and said *n* distribution units so that the start/-stop frequency ratio per cycle is *n*:1 and that the distribution units have long movement times and brief pauses and the conveyor unit has brief movement times and long pauses.

3,912,124
SINGLE COPY NEWSSTAND VENDOR

Dale Farnsworth Pinkerton, 1365 Manzanita Drive, Millbrae, Calif. 94030

Filed Oct. 21, 1974, Ser. No. 516,717
Int. Cl.² G01F *11/28*
U.S. Cl. 221—298 **9 Claims**



. **1.** A single copy newspaper vendor for vending a stack of vertically upright publications, said vendor comprising: a front panel having the leading edition of said stack of vertically upright publications juxtaposed thereto; a shelf mounted for reciprocation towards and away from said front panel having a publication supporting surface for supporting the edge of said publications; means for reciprocating said shelf towards and away from said front panel to define in the reciprocated position away from said front panel a vending interval; a lip mounted to the lower forward end of said inclined reciprocating shelf for upward and downward reciprocation with respect to the publication supporting surface of said shelf; and, means for upward reciprocation of said lip above the publication supporting surface of said reciprocating shelf vending interval upon rearward reciprocation of said shelf to move into the interstitial area between the front edition of said stack to dispense an edition of said upright publications through said vending interval and retain the remainder of the publications supported on said reciprocating shelf.

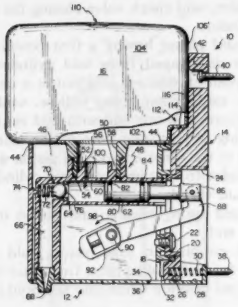
3,912,125
DISPENSER FOR FLUENT MATERIALS AND CONTAINER

John Ross Acklin, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Aug. 12, 1974, Ser. No. 496,745
Int. Cl.² B67D *5/64*
U.S. Cl. 222—165 **1 Claim**

1. In combination a fluent material dispenser and a cooperating container for fluent material to be dispensed, said dispenser including a mounting bracket and a body portion adapted to receive and hold the container and dispense the contents thereof, means securing the body portion to the mounting bracket for rotation from a container receiving position to a dispensing position and means on said mounting bracket and on said container preventing release of the container from the body portion when the body portion is rotated into the dispensing position, said release preventing means

comprising a curvalinear ridge on said mounting bracket and a complementary curvalinear depression on said container.



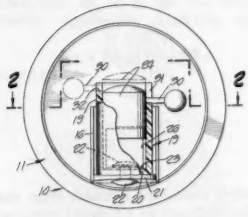
said ridge and said depression each having a center of curvature substantially on the axis of rotation of the body portion.

3,912,126

SNAP-ON MEASURING DISPENSER FOR COFFEE CONTAINERS AND THE LIKE

Russell P. Harshberger, Pasadena, Calif., assignor to Donald Bohler, Sierra Madre, Calif.

Filed Mar. 4, 1974, Ser. No. 447,557
Int. Cl.² G01F *11/22*
U.S. Cl. 222—307 **4 Claims**



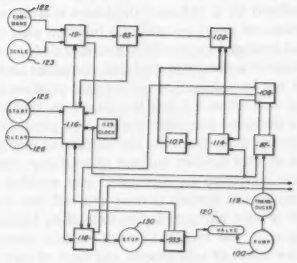
1. A combined snap-on closure and measuring dispenser for a container comprising: a disc-like main body of supple molded plastic material, the periphery of said main body having an annular axially-projecting threadless flange provided with a thin flexible inturned lip sized to have a forced air-tight snap assembly fit over the conventional out-turned rim edge of a metal container designed to hold a molded plastic cover in place thereon, the midportion of said main body having a hollow boss projecting outwardly therefrom on the opposite side thereof from said annular flange, said hollow boss having a semi-cylindrical seating surface closed at one end and open at the other end thereof, a hollow measuring rotor closed at one end and having a cylindrical exterior surface having a snug rotary fit against said semi-cylindrical seating surface with its closed end seated snugly against the interior face of the closed end of said semi-cylindrical seating surface, fastener means holding said rotor rotatably assembled to the closed end of said hollow boss, said rotor having an opening in the sidewall thereof registerable with an outlet opening through said cylindrical surface when said rotor is rotated into the charging position thereof, and said rotor being rotatable after receiving a charge through one half a revolution to the dispensing portion thereof, one end of said rotor being provided with a cylindrical closure plug having a snug fit with the juxtaposed interior sidewall of said rotor, and means including an operating handle for said rotor to hold said plug adjusted in a selected one of several different positions axially of said rotor whereby said dispenser can be adjusted to dispense a preselected one of several quantities of material from a container during an operating cycle of said rotor, and said one rotor end being provided with a series of axial notches of different depths, and said operating handle extending outwardly from said plug and being seatable at the inner end of a selected one of said notches thereby to position said plug appropriately for said rotor to dispense a desired measured quantity of material from a container to which said dispenser is attached.

3,912,127

PRECISION METERING SYSTEM

Donald K. Georgi, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Oct. 29, 1974, Ser. No. 518,260
Int. Cl.² G01F *11/06*
U.S. Cl. 222—309 **20 Claims**



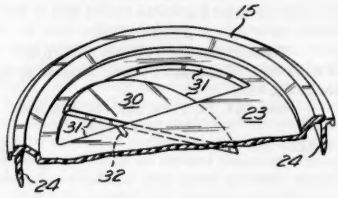
1. Apparatus for selecting and metering the quantity of material pumped from a reciprocating-piston pump, comprising:

a. piston displacement-tracking means for generating electrical signals responsive to piston displacement changes;
b. selection and conversion means for manually selecting a desired pumped quantity and converting said manually selected quantity into electrical signals representative of said quantity;
c. a first register connected to said piston displacement-tracking means, for accumulating and storing said displacement electrical signals;
d. a second register connected to said selection and conversion means, for storing said quantity-representative electrical signals;
e. a comparison circuit connected to said first and second registers, for generating a stop signal when said respective register signals are equal;
f. first means for electrically biasing said first register signals, connected to said piston displacement-tracking means and to said first register, for compensating for metering inaccuracies in the regions of piston displacement direction change; and
g. second means for electrically biasing said first register signals, connected to said piston displacement-tracking means and to said first register, for compensating for metering inequality in respective different piston displacement directions.

3,912,128
END CLOSURE WITH INTEGRAL SAFETY FULCRUM PIN

Carl N. Ziemann, Broadview Heights; Michael J. Duffy, Mayfield Heights, and Albert J. Weatherhead, III, Cleveland Heights, all of Ohio, assignors to Weatherchem Corporation, Cleveland, Ohio

Filed Oct. 29, 1973, Ser. No. 410,810
Int. Cl.² B65D *47/10*
U.S. Cl. 222—541 **2 Claims**

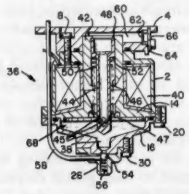


1. A container comprising a tube, a bottom end closure, and a top end closure, said top end closure including a one piece plastic cap secured to said tube, said cap including a removable tab defined by a reduced thickness tearing web at the bottom surface of said cap and two fulcrum pins being constructed and arranged to provide a pivotal axis for rotating one end of said tab in a direction into said container and the other end of said tab in a direction out of said container to break said tearing web when a force is exerted on said one end of said tab in a direction into said container, a groove in said cap extending downwardly from the top surface of said cap to said tearing web at said bottom surface of said cap, each of said fulcrum pins including an elongated pin molded integrally with said cap on the bottom surface thereof, the longitudinal axis of each of said elongated pins extending laterally across said tearing web, the length of each of said elongated pins exceeding the width of said groove and each of said elongated pins extending beyond said tearing web on both sides of said tearing web a substantial distance sufficient to prevent breaking of said elongated pins during said breaking of said tearing web whereby said elongated pins prevent said tab from falling into said container, and said elongated pins being frangible in response to a shearing force substantially in excess of the force required to shear said tearing web whereby after said breaking of said tearing web said elongated pins may be broken to permit removal of said tab whereby said tab may be permanently removed to provide a dispensing passage.

3,912,129
LIQUID DISPENSER

Crawford R. Meeks, Jr., Culver City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 30, 1974, Ser. No. 510,192
Int. Cl.² B67D *5/58*
U.S. Cl. 222—189 **2 Claims**



1. A liquid dispenser comprising:

a liquid-tight vessel having a vent to the exterior thereof;

a cylinder, said cylinder having its open end exposed to the interior of said vessel;

a check valve, said check valve closing the opposite end of said cylinder;

a piston, said piston having a first position wherein said piston is disengaged from said cylinder and having a second position wherein said piston is engaged with said cylinder, said piston being hollow, said piston further communicating at one end with said vent to the exterior and having at least one hole in the side of said piston adjacent to the other end of said piston which engages in said cylinder to vent gas from said cylinder to said exterior of said vessel;

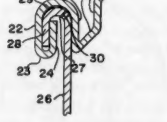
a spring, said spring biasing said piston toward said first postion; and

a solenoid coupled to said piston, said solenoid being adapted to move said piston from said first position to said second position when said solenoid is energized.

3,912,130
PRESSURE RELEASE MECHANISM

Peter G. Pelton, Carol Stream, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,012
Int. Cl.² B65D *83/14*
U.S. Cl. 222—396 **11 Claims**



1. Safety venting means for a double seam structure of the type securing an end unit to a flanged container body, said venting means comprising openings buried in said double seam, said openings being uncoverable upon the deflection of said end unit consequent to internal overpressurization of the container.

3,912,131
AEROSOL DISPENSER CAN

Abraham Friedman, 119 Schenck Ave., Great Neck, N.Y. 11021, and Charles R. Reed, Jr., Rte. No. 7, Box No. 451, Elkhart, Ind. 46514

Filed July 5, 1974, Ser. No. 485,822
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.1 **1 Claim**

1. An aerosol dispenser can comprising:-

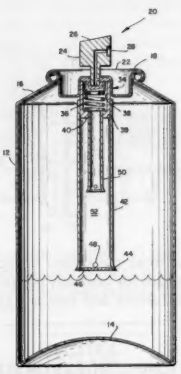
a. a can having a discharge at an upper end and containing liquid propellent and vapor under pressure at a lower end, said liquid propellent establishing a liquid level within said can;

b. a valve control at said discharge end of said can;

c. a first tube interiorly of said can extending downwardly from said valve control through said vapor but terminating before said liquid level, said first tube being closed at its bottom end and having a plurality of holes therein; and

d. a second tube approximately one-half the length of said first tube disposed within said first tube in communication with said valve, said second tube being closed at its bottom end, and having a plurality of holes therein, said plurality of said holes in said second tube being disposed

closer to said valve than said plurality of holes in said first tube, so that when said valve is opened, said vapor will

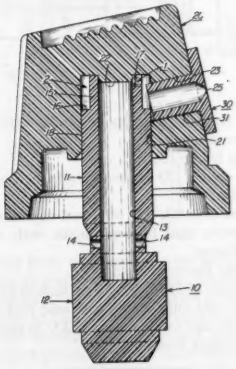


pass though said holes in said first tube and through said valve, while said liquid will be retained in said can.

3,912,132
DISPENSER VALVE ASSEMBLY FOR A PRESSURIZED AEROSOL DISPENSER

Silvester William Stevens, Macquarie Fields, Australia, assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,728
Claims priority, application Australia, Sept. 27, 1973, 60775/73
Int. Cl.² B67D *83/14*
U.S. Cl. 222—402.1 **4 Claims**



1. In a dispensing valve assembly for a pressurized aerosol dispenser, said valve assembly including;

a movable valve body having an upstanding valve stem with a coaxial product passageway and a valve orifice in communication with the stem passageway, and

a valve actuator having a valve stem receiving socket for removably engaging said valve stem and having a discharge orifice in communication with said valve stem passageway, the improvement which comprises:

a central plug in said valve stem receiving socket, said plug closing the upper end of said valve stem passageway,

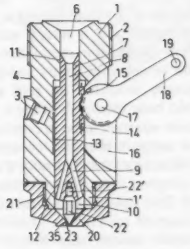
said valve stem including an upper portion of smaller external diameter than the lower portion to define an annular chamber within the valve stem receiving socket, said annular chamber being in communication with said discharge orifice, and

an upwardly open slot extending through said upper portion between the valve stem product passageway and the annular chamber to provide the product flow rate controlling restriction of the valve assembly.

3,912,133
LEVER-ACTUATED BIAS FOR FLOW RESPONSIVE INJECTOR NOZZLE

Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Germany

Filed July 16, 1974, Ser. No. 488,964
Claims priority, application Germany, July 16, 1973, 2336099; Feb. 28, 1974, 2409531
Int. Cl.² B29F *1/03*
U.S. Cl. 222—496 **7 Claims**



1. An injector nozzle for injection molding machines comprising:

an elongated nozzle body having a rear mounting end and a front discharge end;

a center bore extending axially through the nozzle body and defining in succession, from rear to front, an inlet, a small rear guide bore, a large front guide bore, an antechamber, and an injection orifice of greatly reduced diameter at the forward end of the bore;

a valve seat disposed at the rearward entrance to the injection orifice;

a valve plunger received inside the center bore of the nozzle body for axial movement therein, the plunger having a small diameter portion cooperating with the small guide bore to form a small, rearwardly facing piston area therewith and a large diameter portion cooperating with the large guide bore to form a large, forwardly facing piston area therewith, the thereby defined differential piston areas being exposed to the injection material flowing through the nozzle, which urges the valve plunger rearwardly, when the injection material is pressurized;

an injection channel extending axially through the valve plunger into the antechamber of the nozzle body bore;

a nozzle pin arranged at the front end of the valve plunger so as to cooperate with the valve seat, opening and closing the injection orifice, when the plunger moves accordingly;

an actuating member operatively connected to the valve plunger and arranged to reach radially through the nozzle body; and

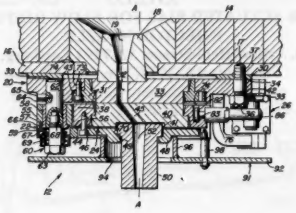
means cooperating with the actuating member for biasing the valve plunger forwardly toward the closed position of its nozzle pin, in opposition to the differential piston action of the valve plunger.

3,912,134

ROTARY SLIDING GATE VALVE FOR MOLTEN METAL

Michael Poran, Westwood, N.J., assignor to Officine Meccaniche Danieli, Udine, Italy

Filed Apr. 29, 1974, Ser. No. 465,424
Int. Cl.² B22D 37/00
U.S. Cl. 222—504 11 Claims



1. The combination of a vessel having a discharge port for dispensing molten metal and a rotary valve mechanism for controlling the flow of molten metal teemed from the discharge port of said vessel, said rotary valve mechanism comprising a base means mounted on said vessel adjacent its discharge port, said base means defining a first throughgoing teeming bore therein adapted to be in communication with the discharge port, a support member connected to said base means, rotatable closure means defining a second throughgoing teeming bore adapted to be placed into and out of communication with said first throughgoing teeming bore rotatably mounted in said support member, a nozzle means secured to said rotatable closure means, said nozzle means defining a third throughgoing teeming bore axially aligned with the central axis of the valve mechanism and communicating with the second throughgoing teeming bore, the end of said second through-going teeming bore communicating with said third throughgoing teeming bore being axially aligned with the central axis of the valve mechanism and the other end of said second throughgoing teeming bore adapted to communicate with said first throughgoing teeming bore being laterally offset from the central axis of the valve mechanism, and actuator means connected to rotate said rotatable closure means against said base means so that said second throughgoing teeming bore can be placed into and out of communication with said first throughgoing teeming bore, or in any position between these extremes without changing the axis of the outflowing metal from the third throughgoing teeming bore.

3,912,135

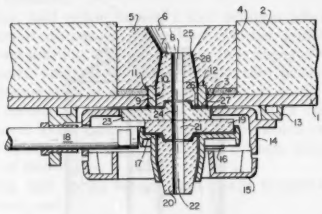
ALIGNING RING FOR REFRACTORY BRICK AND SLEEVE OF SLIDING GATE

Ernst Meier, Adliswil, ZH, CH, Switzerland, assignor to Stopinc Aktiengesellschaft, Switzerland

Filed Apr. 17, 1974, Ser. No. 461,788
Claims priority, application Switzerland, Apr. 17, 1973, 5532/73
Int. Cl.² B22D 37/00
U.S. Cl. 222—561 14 Claims

1. In a spout for metallurgical vessels, particularly including an exterior metal jacket with an opening therein, a refractory lining with an opening therein aligned with said jacket opening, a slide closure, a refractory apertured brick mounted in said opening of said refractory lining of said vessel and accessible from the interior of said vessel, and a refractory sleeve mounted in the aperture of said brick and removable outwardly therefrom, the improvement comprising:

a single cylindrical ring fixed to the inner surface of said jacket opening and extending inwardly of said vessel from said jacket, said ring having an inner first peripheral surface contacting an outer peripheral surface of said sleeve and comprising means for centrally positioning said sleeve with respect to said brick and said jacket opening, said ring having a second peripheral surface



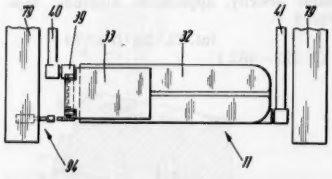
contacting an inner peripheral surface of said brick and comprising means for centrally positioning said brick with respect to said sleeve and said jacket opening.

3,912,136

DEVICE FOR FOLDING SHIRTS OR SIMILAR ARTICLES OF CLOTHING FOR PACKING

Karl-Heinz Nolte, Vlotho, Weser, Germany, assignor to Firma Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Weser, Germany

Filed May 20, 1974, Ser. No. 471,611
Claims priority, application Germany, May 23, 1973, 2326222
Int. Cl.² A41H 33/00
U.S. Cl. 223—37 3 Claims



1. A device for folding shirts or similar articles of clothing for packing comprising:

a. a movable frame (39);

b. a folding means (33) movably attached to said movable frame (39);

c. first means (91, 92, 93) attached to said movable frame (39) to move said folding means with respect to said movable frame

d. a stationary frame (79); and

e. second means (95, 96, 97, 98) attached to said stationary frame (79) and engageable with said first means (91, 92, 93) to cause said folding means (33) to move with respect to said movable frame.

3,912,137

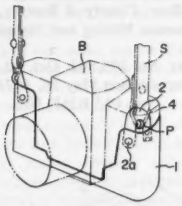
CAMERA CASE

Masakazu Tomatsuri, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,329
Claims priority, application Japan, Dec. 28, 1972, 48-4775
Int. Cl.² A45F 5/00
U.S. Cl. 224—5 V 3 Claims

1. A case for a camera which is suspended by a strap (S) through suspension rings (4) connected to pendants (P) provided on the opposite sides of a camera body, the case comprising; two connector members (2) provided at locations on the camera case corresponding to said two pendants, respectively, each of said connector members having one end secured to said camera case and the other end releasably en-

gageable with said camera case, whereby said connector members (2) may be caused to stride said pendants (P) between said camera body and said suspension rings (4) and said other



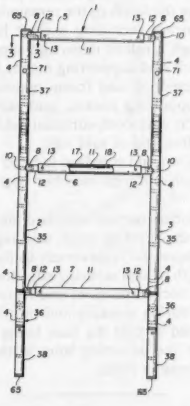
end of each said connector member (2) may be engaged with said case, thereby uniting said camera body and said camera case together and protecting said camera body from abrasion by said suspension rings.

3,912,138

BACK PACKING AND CAMPING SYSTEM

Norman Pava, 2726 S. Shelley Road, North Bellmore, N.Y. 11710

Filed Feb. 12, 1974, Ser. No. 441,756
Int. Cl.² A45F *4/04*
U.S. Cl. 224—10 **8 Claims**



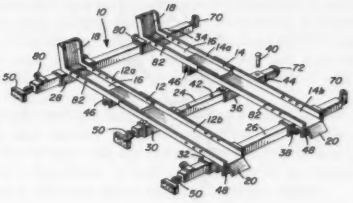
1. In a camping back pack of the type having a load-supporting frame and at least one fabric bag-like container selectively readily attachable to, and detachable from, a supported position in relation to said frame, said load-supporting frame comprising: plural tubular frame-forming elements having operative telescoped positions within each other so as to form a rectangular interconnected construction of vertically oriented sides and horizontally oriented bracing members in spanning relation therebetween, each said tubular frame-forming element having two cooperating facing openings therein in a select number at spaced locations therealong, said operative telescoped positions of said frame-forming elements producing alignment between select numbers of said openings of said frame-forming elements, and plural connecting members each projected through a cooperating group of aligned openings for maintaining said interconnected telescoped positions of said frame-forming elements and each having an accessible end extending from said frame-forming elements; and said bag-like container comprising a body bounding an internal storage compartment and having at least two vertically oriented side flaps along opposite marginal edges thereof, said side flaps having openings therealong through which said accessible ends of said connecting members are adapted to be projected incident to providing said supported position of said container on said frame, whereby said container is also readily detached from said frame merely upon withdrawal of said side flap openings from about said ends of said connecting members.

3,912,139

REMOVABLE VEHICLE MOUNTED CYCLE CARRIER

Jimmy W. Bowman, 1433 W. Princeton, Ontario, Calif. 91762

Filed Jan. 17, 1974, Ser. No. 434,138
Int. Cl.² B60R *9/10*
U.S. Cl. 224—29 R **15 Claims**



1. A cycle carrier for mounting upon a flat bed having longitudinally extending, upstanding, substantially parallel side walls, said carrier comprising:

a. at least one longitudinally extending, longitudinally extensible, elongated, upwardly opening, generally U-shaped member having an upturned portion at one end thereof said member comprising upstanding side portions and a web portion connecting said side portions for receiving the wheels of a cycle thereon, said member supported on said bed and including a longitudinally extending slot in the web portion of said U-shaped member adjacent said upturned end portion, said slot having a length less than the diameter of the cycle front wheel for receiving a portion of said front wheel therein and cooperating with said upturned end portion to support the front wheel of said cycle;

b. at least two transversely extending sleeve members spaced apart along the length of and depending from each said wheel receiving member to space said wheel receiving members from said bed;

e. elongated, generally parallel, transversely extending brace members projecting through and slidable in said sleeve members and engaging said side walls for adjustably securing said wheel receiving member against longitudinal movement in said bed;

d. means for adjustably securing said wheel receiving member against lateral movement along said brace members relative to said side walls; and

e. length adjusting and frictional wall engaging means on at least one end of each said brace member, said length adjusting means comprising a shank extending from one end of said brace member and movable toward and away from said side wall and said wall engaging means disposed on the end of said shank remote from said brace member.

3,912,140

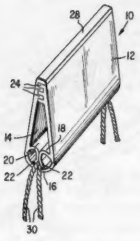
CARRYING HANDLE FOR PACKAGES OR THE LIKE

Hoton M. Franges, 20 E. 35th St., New York, N.Y. 10016

Filed Nov. 30, 1973, Ser. No. 420,611
Int. Cl.² B65D *63/18*
U.S. Cl. 224—45 P **16 Claims**

16. A carrying handle for packages or the like which is made of flexible and resilient plastic material and which can be moved from an open, stored position to a folded, use position, comprising a pair of vertically elongated side walls sepa-

rated by and integrally connected to a curved retainer section the outer surface of which serves as the carrying surface of the handle in use, each of said side walls having resilient retainer portions which together form a channel at their abutting edges, the free ends of said retainer portions being spaced from said curved retainer section and from each other when said handle is open thereby to define a retaining area into which a rope or handle can be positioned after passage through said channel, and mating closure means formed on

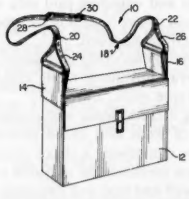


said side walls which cooperate when the side walls are folded to removably secure the same thereby conditioning said handle for use, said side walls when thus folded forming a continuation of said curved retainer section thereby to facilitate carrying of said handle, the closing of said side walls serving to move the free ends of said retainer portions toward the confronting surface of said curved retainer section and into engagement therewith and with each other, thereby locking said rope or handle in said retaining area until said handle is opened.

3,912,141
ADJUSTABLE HANDLE

Emma Appel, 37 Shahal St., Givat Mordechai, Jerusalem, Israel

Filed Mar. 19, 1974, Ser. No. 452,534
Int. Cl.² A45C *11/00*
U.S. Cl. 224—46 R **8 Claims**



1. An adjustable handle in combination with a receptacle comprising:

a single belt having its two ends attached to said receptacle;

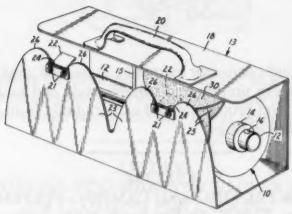
two retention means, each movable on said belt for slidably receiving on said belt;

said belt traversing said retention means to form a generally Z-shape, whereby the length of said handle is adjusted by moving said retention means relative to each other; and means for securing said retention means to said belt to prevent movement after said adjustment.

3,912,142
DISPENSER FOR A ROLL OF PRESSURE-SENSITIVE ADHESIVE COATED ABRASIVE DISCS

Armin H. Steinhauser, St. Paul, and Eugene L. Baratto, Township of White Bear, County of Ramsey, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 295,842, Oct. 10, 1972, Pat. No. 3,849,949. This application May 16, 1974, Ser. No. 470,526
Int. Cl.² B26F *3/02*
U.S. Cl. 225—52 **2 Claims**



1. A device for dispensing individual items from a concatenated roll of joined items comprising:

supporting means for rotatably supporting a concatenated roll of joined items having necked portions substantially narrower than the width of the remainder of the item, said supporting means including a shaft having a length to extend through a roll of items and support said roll;

a frame in which said supporting means is mounted;

a standard formed on said frame opposite to and spaced from said supporting means, said standard having disposed thereon a smooth-surfaced retention member to support the free end of said roll;

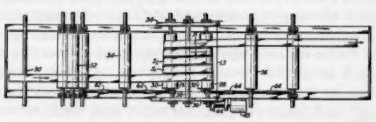
a severing edge on said standard located adjacent the edge of said smooth-surfaced member opposite said support means; and

registering members on said standard and located adjacent each end of the severing edge, said registering members projecting above and transversely to the severing edge to limit the length of said severing edge for engaging an item adjacent the necked portions and restricting the dispensing of items during severing and insuring that each item will be indexed so that the item being dispensed will be severed from the adjoining item at the necked portion between successive items.

3,912,143
METHOD AND APPARATUS FOR GUIDING STRAND-LIKE MATERIALS

Paul W. Miller, Warren; Norman H. Fobes, Cortland; Edward J. Thompson, Kinsman; Eugene K. Redman, Cortland, all of Ohio, and James A. Lavender, Jr., New Castle, Pa., assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1973, Ser. No. 405,250
Int. Cl.² B65H *23/32*
U.S. Cl. 226—3 **2 Claims**



1. A method of processing a continuous moving strip of material while passing through a working station comprising the steps of:

feeding said strip to spaced-apart roller means arranged in said station in a manner that the strip is supported by and between said roller means and caused to assume two or more side-by-side spiral paths of travel and wherein each portion of said supported strip is exposed a number of times to a working zone,

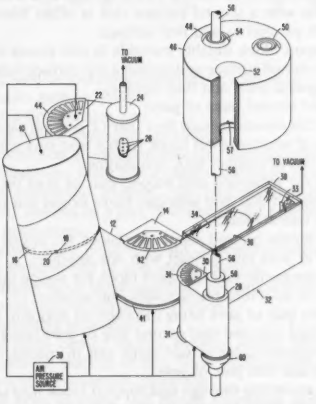
causing similar ends of said roller means to be displaced by rotation about their opposite ends and about a common axis from which they extend equal distance,

varying said displacement to cause the frictional force between said roller means and strip to move the strip axially of said roller means to a force equilibrium position relative to said roller means whereby adjacent supported portions of said strip are maintained parallel to each other assuring said number of exposures thereof.

3,912,144
TAPE TRANSPORT FOR MAGNETIC RECORDING WITH A ROTATING HEAD

Paul J. Arseneault, Boulder County, and Ernest P. Kollar, Wild County, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 375,966, July 2, 1973, abandoned.
This application Nov. 18, 1974, Ser. No. 524,845
Int. Cl.[2] B65H *23/02*
U.S. Cl. 226—3 **17 Claims**



1. In a tape transport for moving magnetic tape from a tape source around a mandrel to a tape sink wherein the mandrel surface radially guides the tape along the path of a rotating magnetic transducing means for writing and reading slant tracks on the tape, the improvement comprising:

means for supporting the tape above the mandrel surface with a stable air bearing as the tape wraps the mandrel; source guide means mounted between the source and the air bearing mandrel for compliantly edge guiding the tape continuously for a first predetermined length from a point adjacent the tape source to a point adjacent the air bearing mandrel;

said source guide means being transversely and pivotally compliant and said first predetermined length being sufficient to allow said transversely and pivotally compliant source guide means to decouple perturbations in tape movement generated at the source from the section of tape wrapping the air bearing mandrel;

sink guide means mounted between the air bearing mandrel and the sink for compliantly edge guiding the tape continuously for a second predetermined length from a point adjacent the air bearing mandrel to a point adjacent the tape sink;

said sink guide means being transversely and pivotally compliant and said second predetermined length being sufficient to allow said transversely and pivotally compliant sink guide means to decouple perturbations in tape movement generated at the sink from the section of tape wrapping the air bearing mandrel.

10. Method for creating a tape path region of high stability for tape along the path of a rotating head comprising the steps of:

helically wrapping the tape in the region of high stability about an air bearing mandrel which supports the tape along the path of the rotating head, the thickness of the air bearing being relatively invariant with variations in tape tension or air bearing pressure;

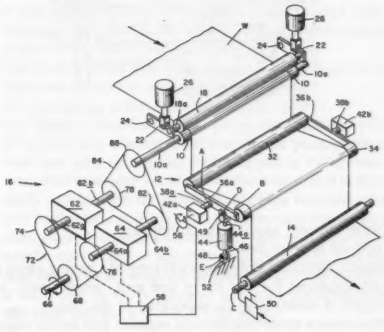
decoupling the high stability region of the tape from tape source and tape sink disturbances to the tape by continuously edge guiding the tape over air bearings for a predetermined length before and after the high stability region; said edge guiding step being pivotally and transversely compliant for said predetermined length before and after the high stability region;

said predetermined length being long enough so that position and motion disturbances in the tape at the tape source or tape sink are reduced by the pivotal and transverse compliance of said guiding step to an acceptable level in the tape inside the high stability region.

3,912,145
WEB TENSION CONTROL SYSTEM

Edward F. Meihofer, Norfolk, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Filed Mar. 4, 1974, Ser. No. 447,695
Int. Cl.[2] B65H *25/04*
U.S. Cl. 226—44 **21 Claims**



1. A system for controlling tension in a moving web comprising

A. a draw roll for engaging said web,

B. a guide roll spaced from and parallel to the draw roll for engaging said web,

C. a balanced, undamped, low inertia dancer assembly positioned between the draw roll and the guide roll, said dancer assembly including

1. a frame, and

2. a pair of spaced-apart dancer rolls rotatively supported by the frame so that their axes are parallel to the draw and guide roll axes and for engaging opposite sides of said web,

D. means for pivotally mounting the frame so that it can pivot about an axis midway between and parallel to the dancer rolls in response to changes in the tension of the web,

E. means for applying a torque to the dancer assembly so as to offset the torque applied thereto by a selected tension in the web so the assembly tends to assume a reference

position, said torque-applying means applying torque by exerting a force on said assembly which is directed along a line which remains parallel to said entering and leaving web paths as the dancer assembly deviates from its reference position,

F. means for detecting movement of the dancer assembly away from its reference position in response to a change in web tension and producing an output signal in response thereto, and

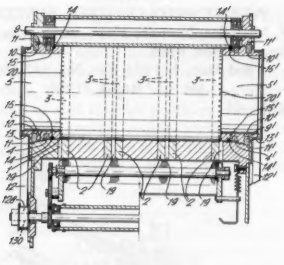
G. means responsive to said output signal for applying the proper torque correction to the draw roll to change the tension in the web such that the dancer assembly tends to return to its reference position.

3,912,146

APPARATUS FOR SUPPORTING A LENGTH OF SHEETING AT A WORKING SITE

Kenneth Walter O'Riley, Surrey, England, assignor to Vickers Limited, London, England

Filed July 29, 1974, Ser. No. 492,782
Int. Cl.² B65H *17/24*
U.S. Cl. 226—95 **12 Claims**



1. Sheet-support apparatus, comprising:

an endless support belt;

a support structure defining a working site having entry and exit locations for the entry and exit, respectively, of a length of sheeting to be supported at the site;

carrier means mounting the said support belt on the support structure for circulation, from the entry location to the exit location, through the working site, constraining the belt to define a concave support surface for such a length of sheeting at that site, and enabling the belt to circulate back from the exit location to the entry location externally of the working site along a first path; and

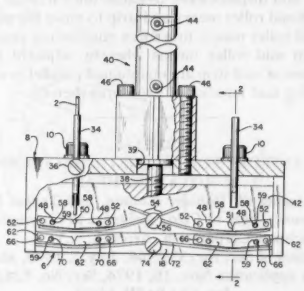
gripping means supported by the said carrier means for simultaneous circulation with the said support belt through the working site adjacent to the said concave support surface and enabling the gripping means to circulate back from the exit location to the entry location externally of the working site along a second path which diverges from the said first path at a sheet-removal location but subsequently converges towards the said first path at a sheet-insertion location, thereby permitting such a length of sheeting to be inserted between the support belt and the gripping means at the sheet-insertion location and carried, held against the support belt by the gripping means, by such simultaneous circulation into the working site to be supported against the said concave support surface.

3,912,147

WIRE FEEDING MECHANISM

Paul Omer Dube, Chelmsford, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Dec. 17, 1973, Ser. No. 424,943
Int. Cl.² B65H *17/44*
U.S. Cl. 226—151 **7 Claims**



1. A device for feeding flexible wire comprising:

a supporting block having a first surface and a contiguous recess with a second surface that is offset from and extends parallel to said first surface;

a transport block slidably movable in said recess relative to said second surface and having a top surface substantially congruent with said first surface;

first and second pairs of jaws;

means for mounting said first pair of jaws on said top surface of said transport block so that said jaws can move in and out of contact with one another;

means for mounting said second pair of jaws on said first surface so that said jaws can move in and out of contact with one another;

spring means on said supporting block for urging said first pair of jaws into contact with one another;

spring means on said transport block for urging said second pair of jaws into contact with one another;

said first pair of jaws being disposed on opposite sides of a selected axis and said second pair of jaws being disposed on opposite sides of said same axis in spaced alignment with said first pair of jaws;

means extending through said support block into said recess and attached to said transport block for reciprocally moving said transport block relative to said second surface so that said second pair of jaws will move back and forth along said axis toward and away from said first pair of jaws; and

guide means for guiding a flexible wire along said selected axis between said jaws, said jaws being adapted so that one pair of jaws grips said wire when said transport block moves in a first direction relative to said support block and the other pair of jaws grips said wire when said transport block moves in a second opposite direction relative to said support block.

3,912,148

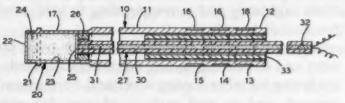
COMBINATION WELDING AND BRAZING DEVICE

Wayne R. Johnson, Canal Fulton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,715
Int. Cl.² B23K *21/00*
U.S. Cl. 228—2.5 **6 Claims**

1. A device for brazing and welding in close proximity to each other comprising, a sleeve having two ends on opposite extremities thereof and a hollow center, a surface on one of said sleeve ends for use in establishing the weld, a surface on

the other of said sleeve ends for use in establishing the braze, a brazing material on the brazing end, an explosive charge within said sleeve and adjacent to the weld surface, and a less



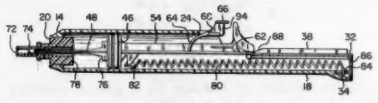
powerful explosive charge within said sleeve and adjacent to the brazing surface, said charges being effective upon detonation to create a weld including the weld surface and to position the brazing surface in a condition to be brazed.

3,912,149

PORTABLE DESOLDERING TOOL

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 95969

Filed Oct. 15, 1974, Ser. No. 515,003
Int. Cl.² B23K *1/00*
U.S. Cl. 228—20 **9 Claims**



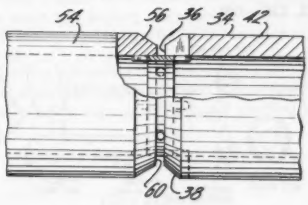
1. Hand held desoldering implement comprising:
body barrel member having
forward tip retaining end,
central hollow cylindrical portion,
rear extension, sheath portion being substantially a longitudinally cut away half-cylinder extension of said central cylindrical portion, the half-cylinder extension being defined by a pair of diametrically opposed parallel axial edges,
first guide plate hinging means disposed contiguously to the forward end of said sheath portion,
first trigger-latch means disposed contiguously to the rear of said central cylindrical portion;
piston assembly including
piston body carried axially slidably within said central cylindrical portion of said body barrel member in air pumping relationship therewith,
nozzle bore cleaning rod means extending axially centrally forwardly from said piston body,
cocking plunger means extending rearwardly from said piston body and being terminated in a thumb engageable cocking boss,
second trigger-latch means disposed contiguously to said cocking boss for cooperative engagement with said first trigger-latch means for selectively retaining said piston assembly forwardly in a cocked configuration,
first cocking plunger guide means disposed contiguously to said cocking boss;
guide plate means disposed over the concave surface of said half-cylinder sheath portion of said body barrel and extending substantially in a plane coextensive with said sheath portion between and in juxtaposition with said parallel axial edges thereof and further including
second cocking plunger guide means disposed along its length in engageable relation with said first cocking plunger guide means of said piston assembly for guiding and constraining the rearward axial motion thereof,
second guide plate hinging means carried by said guide plate means contiguously to its forward end and being engaged with said first guide plate means for hingedly affixing said guide plate means to said body barrel member forming an openable cover for said concave surface of said half-cylinder sheath portion and constituting a lever for engaging the rear of said cocking boss and urging said piston assembly further forwardly when said guide plate means is hingedly moved away from its said juxtaposition with respect to said parallel axial, defining edges of said sheath extension portion; and
cocking spring means carried by said body barrel member connected between it and said piston assembly and against which work is done when said piston assembly is urged forwardly along said central cylindrical portion of said body barrel member and which supplies the fly back energy for said piston assembly when released by said trigger latch means.

3,912,150

BACKING RINGS FOR WELDED PIPE JOINTS

James P. Hannah, Jr., Gillette, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 4, 1974, Ser. No. 512,834
Int. Cl.² B23K *5/22*
U.S. Cl. 228—50 **8 Claims**



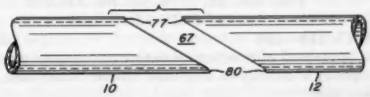
1. In combination:
two pipe sections to be butt welded, one of said pipe sections having a slot in the side wall thereof extending from a butt end of said one pipe section,
a ring having an outside diameter no greater than the inside diameter of said one pipe section;
a tab projecting axially from said ring; and
a pin fixedly secured to and projecting radially outward from said ring whereby said ring can be positioned within said one pipe section so that said pin is within said slot and after said pipe section is aligned so that it is substantially coaxial with the other of said pipe sections, said pin can be moved out of said slot to move said ring axially and then moved circumferentially so that said pipe sections can be moved closer together until they abutt said pins so that said pipe sections are aligned axially and radially and a weld can be made around said pipe sections between the ends thereof to form a butt joint.

3,912,151

TUBE WELDING METHOD

Guy E. Martin, Pittsburgh; Melvin R. Fahnestock, Apollo; Richard Couchman, New Kensington; Guy W. Mahan, Arnold, all of Pa.; Hugh R. Bundy, Massena, N.Y., and Robert C. Pahl, West Lafayette, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 16, 1974, Ser. No. 506,619
Int. Cl.² B23K *31/02*
U.S. Cl. 228—171 **12 Claims**



1. A method of welding the ends of tubes together for drawing purposes, the method comprising the steps of

providing the tube ends with complementary angle cuts, the angle of each cut being less than 90° with respect to the axes of the tubing,

placing and maintaining the cut ends of the tubes in mating, abutting relationship, the abutting ends providing an interface therebetween that is disposed at the same angle, with respect to the tube axes, as that of the angle cuts,

disposing said interface adjacent a welding head, and

welding the tubes together along the interface of the mating, abutting ends to provide a high strength welded joint between the tubes.

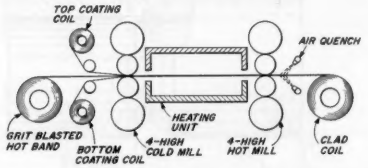
3,912,152
METHOD FOR CLADDING A FERROUS SUBSTRATE WITH NON-FERROUS METALS

James L. Forand, Jr., Kunkletown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 218,802, Jan. 18, 1972, Pat. No. 3,832,147, and a continuation-in-part of Ser. No. 867,014, Oct. 16, 1969, abandoned. This application Mar. 4, 1974, Ser. No. 447,713

Int. Cl.² B23L *31/02*

U.S. Cl. 228—190 **9 Claims**



6. A method for producing a cold-rolled, heat-treated, hot-rolled two-layered composite comprising a ferrous substrate having two surfaces and a cladding of at least one non-ferrous metal taken from the group consisting of copper and aluminum on one surface of the ferrous substrate, comprising:

a. placing the non-ferrous cladding in contact with one surface of the ferrous substrate,

b. cold rolling the composite to effect a reduction of between 5% and 20% in cross-sectional area of the composite and to obtain a mechanical bond between the non-ferrous metal cladding and the ferrous substrate,

c. heating the composite in a protective atmosphere to a temperature in the range between a minimum of about 600° F. and a maximum temperature of about 100° F. below the lower temperature at which the non-ferrous metal cladding mechanically bonded to the surface of the ferrous substrate in step (b) will melt, and

d. hot-rolling the composite to reduce the composite by at least 20% in cross-sectional area while within said temperature range to produce a metallurgical diffusion bond between the non-ferrous metal cladding and said surface of the ferrous substrate.

3,912,153
METHOD AND APPARATUS FOR BONDING SEMICONDUCTOR PILL-TYPE COMPONENTS TO A CIRCUIT BOARD

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 524,899

Int. Cl.² B23K *35/12, 3/06*

U.S. Cl. 228—254 **5 Claims**

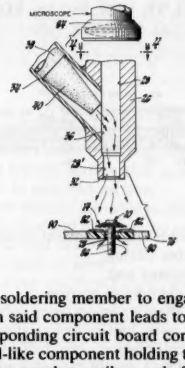
1. A method of bonding miniature semiconductor pill-type components directly to a printed circuit board, said method comprising:

inserting a probe through an opening in a printed circuit board having a plurality of solder-coated conductors converging on said opening;

placing a body of a semiconductor pill-type component on said probe, said pill-type component including said body which encapsulates a semiconductor device chip and a plurality of discrete leads for said chip radially extending from said body and corresponding to said conductors on the circuit board;

positioning a tubular soldering member over said component and its corresponding circuit board conductors, said soldering member having a vertical bore extending therethrough and an end surface adapted for engaging said component leads;

blowing a hot gas through said bore in said soldering member to direct the flow of said gas toward said circuit board conductors thereby heating said soldering member and concurrently melting the solder on said circuit board conductors to a smooth, molten state; aligning said component leads with their corresponding circuit board conductors while viewing said leads and conductors by looking through said bore in the soldering member;



lowering said soldering member to engage the end surface thereof with said component leads to press them against their corresponding circuit board conductors;

inserting a rod-like component holding tool into the bore of said soldering member until an end of said tool abuts said component body thereby providing a downward force to the component;

sliding said soldering member upwardly along the length of said component holding tool to remove said end surface from said component leads, while leaving said holding tool within said bore and abutting said component body until said solder solidifies, thereby retaining component lead-conductor alignment during removal of said soldering member; and

lifting said component holding tool and withdrawing said probe from said component body after solidification of said solder to leave said component permanently soldered to said circuit board.

3,912,154
CONTAINER END CLOSURE ATTACHMENT

Joseph L. Godar, Wauconda, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 3, 1973, Ser. No. 320,695

Int. Cl.² B65D *3/10, 7/42*

U.S. Cl. 229—5.5 **5 Claims**

1. A container, suitable for containing liquids under pressure, comprising:

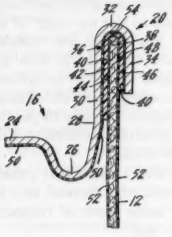
a body portion having an upstanding marginal edge portion and a metallic end closure seamed to and covering at least one open end of said body portion, at least the portions of the surfaces within the seam having an epoxy-resin or vinyl-resin coating or combinations thereof applied thereto;

said end seam being derived in the absence of mechanical locking of the end closure to the body portion and comprising (a) a channel surrounding the periphery of the central panel of said end closure and defined by inner and

outer depending straight wall portions wherein the inner depending straight wall porption merges into the central panel of said end closure and the outer depending straight wall portion is parallel to the inner wall portion and merges with an outwardly extending flange and b) a thermoplastic adhesive bonding the inner surfaces of the channel to the inner and outer surface of the upstanding marginal edge portion of the body;

said thermoplastic adhesive being selected from those derived from the group of:

1. a mixture consisting essentially of about 65 parts by weight of an ethylene-vinyl acetate-organic acid ter-



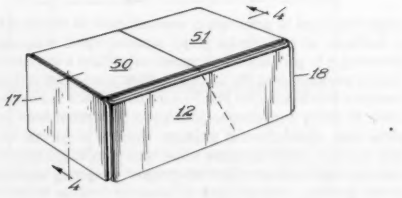
polymer having a 20 percent by volume vinylacetate content and an acid number of 6 and about 35 parts by weight of a polyterpene resin;

2. a mixture consisting essentially of about 56 parts by weight of a styrenebutadiene block copolymer having about 25 percent by volume styrene and about 75 percent by volume butadiene, about 21 parts by weight of a polyterpene resin and about 21 parts by weight of a coumaroneindene resin; and
3. a mixture consisting essentially of about 75 parts by weight of a polyamide having a melt index range of from about 6 to about 15 at 401°F and about 25 parts by weight of a polyterpene resin.

3,912,155
CONTAINER AND BLANK FOR SAME

Harold G. Zastrow, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed May 20, 1974, Ser. No. 471,366
Int. Cl.² B65D *5/18*
U.S. Cl. 229—33 **2 Claims**



1. A one-piece, self-locking, completely enclosed container made from foldably sheet-like material such as corrugated paperboard, said container comprising:

a rectangular bottom panel;

rectangular end wall panels hingedly attached to two opposite ends of said bottom panel, said end wall panels adapted to be folded upward into substantially perpendicular relation to said bottom panel and said end wall panels extending in length a distance substantially equal to said opposite ends of said bottom panel;

rectangular side wall panels hingedly attached to opposite sides of said bottom panel, said side wall panels foldably upward to form the sides of said container substantially perpendicular to said bottom panel, said side wall panels extending in length a distance substantially equal to said opposite sides of said bottom panel, and extending upwards a distance substantially equal to the height of said end wall panels;

corner flaps hingedly attached to either lateral edge of each of said side wall panels adapted to be folded inwardly and like in overlapping relationship with said end wall panels, said end wall panels being on the outside of said container;

a pair of top panel sections, one each hingedly attached to the top edge of said end wall panels and foldably downward to lie in abutting relationship and form the top for said container;

two pairs of top panel locking tabs, one of said pair attached to opposite lateral sides of each of said top panel sections, said top panel locking tabs foldably inwardly and downward to lie in overlapping relationship with said side wall panels on the inside of said side wall panels, each of said locking tabs adapted to lie in close abutting relationship with the respective locking tab attached to the opposite top panel section and lying parallel to the same side wall panel; and

each said locking tab having the edge abutting the opposite top panel section locking tab formed at an oblique angle and parallel to the edge of the opposite abutting locking tab.

3,912,156
PACKING CONTAINERS

Edward Gordon May, Gildersome, near Leeds, England, assignor to John Waddington Limited, England

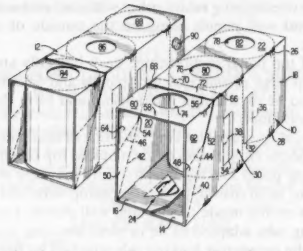
Continuation-in-part of Ser. No. 322,916, Jan. 12, 1973, abandoned. This application July 29, 1974, Ser. No. 492,519
Claims priority, application United Kingdom, May 25, 1971, 17082/71; June 21, 1974, 27559/74
Int. Cl.² B65D *5/02*
U.S. Cl. 229—37 R **10 Claims**

1. A tubular packaging container which is constructed from a blank having two forming creases about which the blank can be folded into flattened sleeve form with the free edges overlapping and secured together, the container being erected by a pushing together of the folded edges of the flattened sleeve, said blank having crease lines which are inclined relative to the length direction of the sleeve so that in erecting the container the blank folds about said inclined crease lines which define corners extending helically of the container, giving the container a twisted helical appearance over at least part of its length.

3,912,157
TWO PIECE CARRIER FOR ARTICLES OF DIFFERENT SIZES

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Feb. 12, 1973, Ser. No. 331,594
Int. Cl.² B65D 5/02, 5/54, 5/70
U.S. Cl. 229—40 4 Claims



1. A carrier for transporting a plurality of articles comprising

first and second cartons, each carton being formed of a single sheet and having top, bottom and side walls and locking means holding said carton together;

means securing said cartons together in side-by-side relationship; and

a pivotal panel formed on one of said cartons including first and second tuck panels formed on opposite walls of said carton and an end panel formed from a wall intermediate said opposite walls of said carton,

said first tuck panels being defined by first and second intersecting score lines, said second tuck panels being defined by said second score lines and intersecting first die cuts,

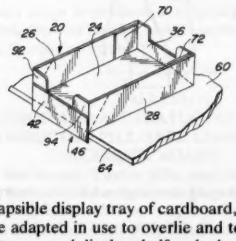
said end panel being defined by a second die cut interconnecting said first die cuts,

such that said pivotal panel is movable from a first position in alignment with the wall intermediate said opposite walls to a second position spanning an end of said carton.

3,912,158
DISPLAY TRAY WITH DEPENDING SKIRT

Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust, Chicago, Ill.

Filed Apr. 29, 1974, Ser. No. 465,184
Int. Cl.² B65D 5/36
U.S. Cl. 229—41 B 4 Claims



1. A collapsible display tray of cardboard, corrugated board and the like adapted in use to overlie and to be supported on a product storage and display shelf and adapted to fold flat for shipment and storage,

said tray including a floor panel, a pair of opposed side panels, and a front and a rear panel each hingedly joined to said floor panel along fold lines and extending upwardly therefrom, and

means connecting each side panel, said front panel and said rear panel to each panel thereadjacent to form an upstanding perimetric wall extending around said floor panel,

a skirt connected to and depending from said front panel as a downward extension thereof,

said skirt projecting below said floor panel to form at a juncture therewith an inside corner adapted to receive therewithin a forwardly directed top edge portion of the shelf on which said tray is supported in use, whereby said skirt covers the forward edge of said shelf and depends downwardly therefrom,

angularly directed corner fold lines formed in said side panels at each end thereof, each said fold lines extending from a lower corner juncture of each said side panel with said floor panel and with said rear panel, each said fold lines being angled upwardly and inwardly from each said corner juncture to the top edge of each said side panel; whereby said side panels are foldable along hinge lines connecting said side panels with said floor panel and along said angled fold lines as said front and rear panels are simultaneously pivoted about said hinge lines to overlie said side panels, thereby to provide a collapsed, substantially flat structure facilitating storing and shipping of said tray prior to use,

tabs hingedly joined to said rear panel along vertical fold lines at each side edge thereof, said tabs overlying and in contact with inside faces of respective said side panels thereadjacent, and

wherein said fastening means connecting said rear panel with said side panels constitute means securing said side panels to said hinge tabs in zonal areas of said side panels which are rearward of said angled corner fold lines formed at the rear end portions of said side panels,

whereby folding of said side panels along said angled fold lines operates to effect pivotal collapse of said side panels and pivotal collapse of said tabs

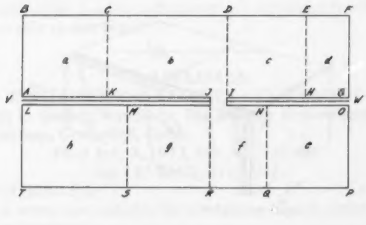
along said vertical fold lines while obviating folding of the tabs themselves,

said tabs thereby constituting pivoting mechanical stabilizers operable to support said side panels of the erected tray in an upright position when said hinge tabs are in substantially full abutment against said side panels and the tray is ready for use.

3,912,159
ONE-PIECE CASE DIVIDER

David R. Danville, Plainsboro, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,167
Int. Cl.² B65D 5/48
U.S. Cl. 229—42 7 Claims



1. A one-piece blank of rectangular shape adapted to be folded to form a divider for a packing case comprising:

i. a longitudinal bisector comprising:

a. two linear non-contiguous terminally disposed slits, and

b. an unsevered interior portion separating said slits, and serving as a hinge on which said blank may be folded along said bisector,

ii. two half sections of said blank defined by said bisector,

iii. three score lines in each of said half sections at right angles to said bisector, and extending transversely from

said bisector to opposing longitudinal edges of said blank,

iv. four panels defined by said three score lines, said panels comprising in each half section,

a. a stationary panel, having a first longitudinal edge comprising said hinge portion and an edge of a part of one of said slits, a second longitudinal edge coincident with a longitudinal edge of said half section, a first transverse edge positioned to terminate at a point coincident with one end of said hinge, a second transverse edge positioned to terminate at said slit,

b. a terminally disposed first foldable panel hingedly connected to said stationary panel at said first transverse edge thereof,

c. an interiorly disposed second foldable panel hingedly connected to said stationary panel at said second transverse edge thereof,

d. a terminarlly disposed third panel hingedly connected to said second foldable panel, said terminally disposed first foldable panel, said stationary panel, said interiroly disposed second foldable panel, and said terminally disposed third panel being in sequential relationship, said score lines cooperating with said slits and said intact hinge portion of said bisecting axis to provide a divider of high compression strength.

3,912,160

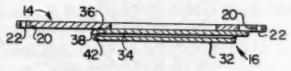
LETTER PACKAGE WITH BREAK-AWAY ITEM

Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Mar. 29, 1974, Ser. No. 456,113

Int. Cl.² B65D *27/10, 27/04, 27/06*

U.S. Cl. 229—69 **4 Claims**



1. An article of manufacture comprising at least one letter package, said letter package being adapted to be received in and carried by a mailing envelope and consisting of a generally rectangular letterhead and a reply item overlying an associated portion of the rear surface of said letterhead and attached thereto, said letterhead consisting of only one piece of sheet material having a window opening therethrough, said reply item consisting of only one other piece of sheet material and comprising a generally rectangular reply card having a portion of its frontal surface exposed in said window opening and a patch integrally connected to said reply card and separated therefrom along a line of weakening, said patch overlying the rear surface of said reply item and having marginal portions thereof adhered to said rear surface of said letterhead, said patch and said letterhead cooperating to form a pocket therebetween, said reply card being at least partially disposed within said pocket, said reply item having a frontal surface area substantially smaller than the frontal surface area of said letterhead and being spaced a substantial distance upwardly from the lower edge of said letterhead and inwardly from at least one side edge of said letterhead.

3,912,161

CONTROL OF GAS FIRED APPLIANCES

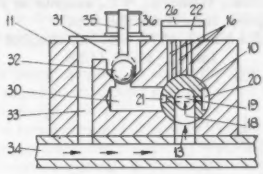
Brian Harding, West Bromwich; Arthur John Aldis, Solihull, and Kenneth Edmund Collins, Sutton Coldfield, all of England, assignors to Parkinson Cowan Appliances Limited, Birmingham, England

Filed June 7, 1974, Ser. No. 477,407

Claims priority, application United Kingdom, June 13, 1973, 28063/73

Int. Cl.² F24B *3/12*

U.S. Cl. 236—1 A **4 Claims**



1. Gas burner control means comprising a manually operable valve which can be set by a user to an off position or a maximum flow position or an intermediate position in which in use the rate of flow of gas through the valve will be less than the maximum rate of flow, a by-pass valve having a closure member which is movable between open and closed positions, said by-pass valve being arranged in use to provide, when said closure member is in its open position and when said manually operable valve is in an intermediate position, a rate of gas flow to the associated burner which is greater than the rate of gas flow which would be achieved by said manually operable valve alone in said intermediate position, a temperature-sensitive device which is arranged automatically to control the operation of said by-pass valve so as to effect movement of said closure member from its open position to its closed position when the temperature sensed by said temperature-sensitive device attains a pre-determined value, and manually operable means for initially setting said closure member in its open position.

3,912,162

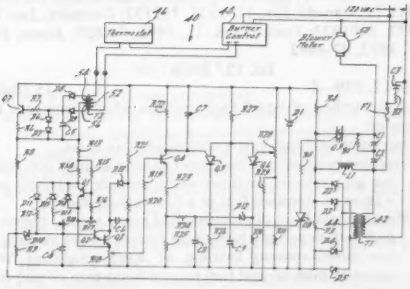
FURNACE BLOWER SPEED CONTROL

Frederick T. Bauer, and Ronald E. Holkeboer, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 7, 1973, Ser. No. 422,729

Int. Cl.² F24D *5/00*

U.S. Cl. 236—11 **14 Claims**



1. In a speed control system adapted to vary the speed of an electric motor as a function of time, the combination including solid state means energizable after a predetermined time delay to start said motor at a low speed and to gradually

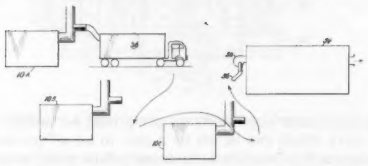
increase the speed of said motor until full motor speed is reached, said system including means operable to delay the start of said motor, means operable to maintain said motor at full speed and means operable to decrease the speed of said motor gradually to a stopped condition, said solid state means including a Zener diode and a timing capacitor, said Zener diode being effective to increase the speed of said motor by charging said timing capacitor.

3,912,163

HEAT ACCUMULATOR SYSTEM

Gregory Theoclitus, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed May 2, 1974, Ser. No. 466,358
Int. Cl.[2] F24D *11/00*
U.S. Cl. 237—13 **7 Claims**



1. An incinerator system including a plurality of independent incinerators that comprise a source of heat, means to be heated, a vehicle movable between the incinerators and the means to be heated, a heat accumulator carried by said vehicle comprising a housing having a mass of heat absorbent material intermediate spaced inlet and outlet ports, means for directing hot gas exhausting from said source of heat through the inlet and outlet ports of the accumulator and over the heat absorbent material therebetween, means for moving the vehicle between the source of heat and the means to be heated, means directing a cool fluid over the heat absorbent material of the accumulator to absorb heat therefrom, and means directing fluid heated by the accumulator to the means to be heated.

3,912,164

METHOD OF LIQUID FUEL INJECTION, AND TO AIR BLAST ATOMIZERS

Arthur Henry Lefebvre, and Eric Roy Norster, both of Bedford, England, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 295,956, Oct. 10, 1972, abandoned, Continuation-in-part of Ser. No. 216,495, Jan. 10, 1972, abandoned. This application June 27, 1974, Ser. No. 483,517
Claims priority, application United Kingdom, Jan. 11, 1971, 1315/71; Canada, Jan. 11, 1972, 132132; Germany, Jan. 11, 1972, 2201033; France, Jan. 11, 1972, 72.857; Japan, Jan. 11, 1972, 47-4992
Int. Cl.[2] B05B *7/00*
U.S. Cl. 239—5 **15 Claims**

1. A method of liquid fuel injection which comprises the steps of:

spreading said fuel into a continuous thin sheet,

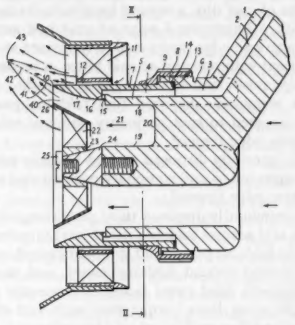
exposing both sides of said sheet to substantially non-rotating high velocity air flows which atomize said sheet into a layer of atomized fuel in a first region, and

injecting said layer of atomized fuel into a second region of high turbulence and high shear formed by the meeting of two contra-rotating swirling air flows emanating from opposite sides of said fuel layer downstream of said first region.

5. An air blast atomizer for carrying out the method of claim 1 which comprises:

means for projecting a thin sheet of fuel encircling a longitudinal axis extending in the direction in which said fuel is projected,

means for providing high velocity substantially non-rotating air flows to both surfaces of said sheet to atomize said sheet into a layer of atomized fuel in a first region of said atomizer, and



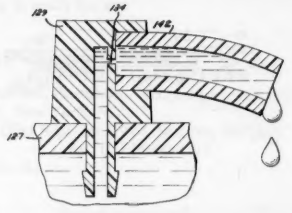
means for providing swirling air flows having components of movement in opposite directions about said axis, one of which air flows impinges on one side and the other of which air flows impinges on the other side of said atomized sheet in a second region of said atomizer downstream of said first region.

3,912,165

METHOD AND APPARATUS FOR CONTROLLED DRIP IRRIGATION FROM CHAMBER MEANS LOCATED AT VARYING ELEVATIONS ALONG SOIL AREAS TO BE IRRIGATED

Edward S. Pira, 116 Rocky Hill Road, Hadley, Mass. 01035

Filed May 22, 1974, Ser. No. 472,448
Int. Cl.[2] A01G *25/00*; B05B *15/00*
U.S. Cl. 239—11 **12 Claims**



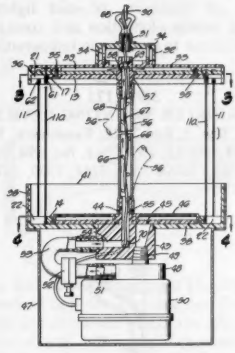
1. In a method of drip irrigation in which an elongated chamber body is located along soil areas to be irrigated characterized by relatively higher elevations and relatively lower elevations whereby the velocity of fluid discharge from portions at lower elevations may be under a pressure which exceeds the pressure of discharge from chamber portions at higher elevations, the steps which include providing a source of fluid material at a predetermined relatively high pressure, conducting the high pressure fluid into a chamber body of a length extending away from the source for a substantial distance through which friction losses incurred along the chamber body are operative to cause a variation to said pressure, reducing the pressure of the fluid as it passes through the chamber body, simultaneously releasing predetermined volumes of fluid through separated discharge outlets communicating with the chamber body, and releasably confining small columns of the fluid in the path of flow of the exiting volumes from their respective discharge outlets to provide a retarded rate of discharge which is substantially uniform for outlets at all elevations.

3,912,166

ORNAMENTAL DEVICE HAVING LINES FOR GRAVITY DESCENT OF LIQUID DROPLETS

Victor H. Chatten, 1567 W. 215th St., Torrance, Calif. 90501

Filed July 16, 1974, Ser. No. 488,967
Int. Cl.[2] B05B 17/08
U.S. Cl. 239—20 11 Claims



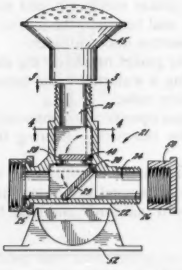
1. In an ornamental device of the class described, the combination of: a pair of vertically spaced plates each having lateral notches, a series of lines received by the notches and extending between the plates, means for delivering liquid laterally to each of the lines at a location below the upper plate to form liquid droplets which descend by gravity along the lines.

3,912,167

AUTOMATICALLY OPERATED WATER DISTRIBUTION SYSTEMS SUCH AS LAWN AND GARDEN SPRINKLING SYSTEMS AND TIMER OPERATED VALVE THEREFOR

Donald R. Simon, R.F.D. No. 1 Townline Road, Mokena, Ill. 60448

Filed Jan. 7, 1974, Ser. No. 431,155
Int. Cl.[2] A01G 25/16
U.S. Cl. 239—66 4 Claims



1. An automatic sprinkler system adapted to be connected via a control valve to a source of water under pressure, comprising in combination

a plurality of valves,

each valve having

an inlet

a bypass outlet

a discharge outlet

passages connecting said inlet to both said outlets,

valve means in said passages for connecting the inlet to the discharge outlet in a first position and for connecting the inlet to the bypass outlet in a second position,

a timer having a cam for controlling the position of said valve means, the timers of said valves being independently settable to establish selected discharge periods for each of said valves, setting of each timer serving to place the associated valve means in its first position,

means engaging said cam for holding the timer in its set position,

means responsive to a flow of water through the discharge outlet for disengaging said cam and releasing said timer thereby initiating the discharge period for the associated valve,

the timer being operable to rotate the cam to switch said valve means to its second position at the termination of said discharge period,

the valves being arranged at spaced locations in an area to be watered and series connected with the first valve having its inlet connected via the control valve to the source of water and each succeeding valve having its inlet connected to the bypass outlet of the preceding valve in the series,

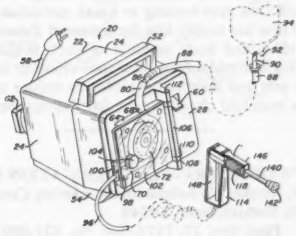
the setting of the individual timers for selected discharge periods providing for a watering cycle initiated by turning on the control valve and in which each succeeding valve in the series is operated successively, the termination of the discharge period of each valve serving to initiate the discharge period of the succeeding valve in the series.

3,912,168

IRRIGATION LAVAGE

Keith M. Mullins, Fort Collins; David W. Smith, Wellington, and Thomas G. Cannon, Fort Collins, all of Colo., assignors to Teledyne Industries, Inc., Teledyne Aqua Tec, Fort Collins, Colo.

Filed Jan. 30, 1975, Ser. No. 545,731
Int. Cl.[2] B05B 3/14, 7/30, 7/02
U.S. Cl. 239—102 7 Claims



5. An irrigation lavage comprising:

a housing defining an enclosed motor-receptive chamber and having continuous side walls and opposing end walls; an electric motor mounted in said chamber and having a drive shaft projecting through one of said end walls;

a boss projecting outwardly from the exterior of said one end wall and defining a generally cylindrical cavity the axis of which coincides with that of said shaft, said boss having inlet and outlet openings defined in spaced portions of its walls;

a roller rotationally mounted on said shaft with the axis of said roller parallel to but offset from that of said shaft, the diameter of said roller being less than the diameter of said cavity;

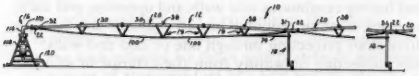
a resiliently-walled flexible tube running from said inlet opening to said outlet opening and around the interior wall of said cavity, the double wall thickness of said tube

being slightly greater than the minimum spacing between said interior wall and said roller;
a door hinged at one side of said boss to close in overlying relationship to said cavity;
and a nozzle assembly coupled to the end of said tube extending from said outlet opening, said assembly including a valve and a valve operator manually adjustable to control the rate of fluid flow through said tube and selectively to cause cessation of said fluid flow.

3,912,169
IRRIGATION SYSTEM
Hilmer G. Lodge, Pala, Calif., assignor to Conflow Irrigation Systems, San Diego, Calif.
Division of Ser. No. 297,959, Oct. 16, 1972, Pat. No. 3,810,582, which is a continuation-in-part of Ser. No. 131,225, April 5, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,526
Int. Cl.[2] B05B *1/14*
U.S. Cl. 239—110 **4 Claims**

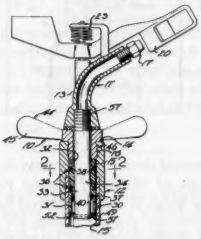
1. An irrigation system, comprising:
a. a supply line;
b. a set of risers disposed in spaced relation along the supply line;
c. a low volume irrigation device joined to the upper end of each riser;
d. a plurality of distributor tubes extending from the outlets;
e. and means disposed downstream from the irrigation devices for opening the supply line to permit flushing of particulate matter therefrom;
f. each irrigation device including a body member defining a manifold chamber, a plurality of outlets communicating therewith, and an inlet valve seat, and a valve member controlling flow of water into the manifold chamber at an upward flow rate tending to cause particulate matter to settle into the supply line for transport therein;
g. the valve and body member of each irrigation device defining a toroidal flow resistance chamber between the valve seat and manifold chamber to reduce the pressure in the manifold chamber and distributor tubes.

3,912,170
LIGHTWEIGHT TRAVELING IRRIGATION SYSTEM
Richard F. Reinke, c/o Reinke Manufacturing Company, P.O. Box 480, Deshler, Nebr. 68340
Filed Nov. 27, 1974, Ser. No. 527,880
Int. Cl.[2] B05B *3/12*
U.S. Cl. 239—177 **8 Claims**



1. In a traveling irrigation system, the combination of
a plurality of wheeled carriages spaced apart from one another in a row for travel in a common direction,
an elongate boom extending between and supported by said carriages, said boom comprising pipe constructed of lightweight metal having a thermal coefficient of linear expansion substantially like that of aluminum,
a plurality of brace members extending beneath and spaced from one another along said boom between said carriages, said brace members attached to said boom;
a system of tie rods connected with the boom between each pair of carriages, system of tie rods comprising end tie rods interconnecting the boom at points near the carriages with brace members and intermediate tie rods interconnecting the brace members with one another in serial arrangement, the tie rods and braces providing linear support for said boom,
said tie rods constructed from a metal having a thermal coefficient of linear expansion substantially less than said coefficient of expansion of said lightweight metal whereby to inhibit elongation and contraction of said boom in response to changes in temperature.

3,912,171
SPRINKLER MOUNTING DEVICE
Victor Johnson, Rte. 2, Box 2022, Kennewick, Wash. 99336
Filed July 22, 1974, Ser. No. 490,516
Int. Cl.[2] B05B *3/02, 3/14, 1/00, 3/06*
U.S. Cl. 239—230 **6 Claims**

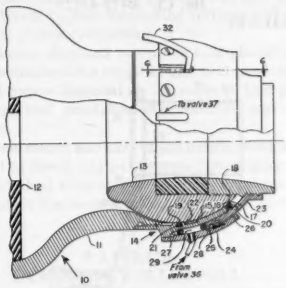


1. A device for mounting a sprinkler to a riser having a smooth cylindrical inner surface of constant diameter, comprising:
a sleeve having an elongated cylindrical outer surface of a cross-sectional diameter slightly less than the diameter of said smooth cylindrical inner surface of said riser and an inner bore of a prescribed diameter extending the full length of said sleeve;
a water delivery tube having a downwardly open cylindrical tubular section extending through the inner bore of said sleeve to an inner end projecting below said sleeve;
said tubular section and inner end having cross-sectional outer diameters slightly less than the diameter of said bore;
first annular gasket means on said sleeve for providing a water-tight seal between the sleeve and riser when said sleeve is inserted into said riser;
second annular gasket means on the sleeve within said bore for providing a watertight seal between said sleeve and water delivery tube;
fastening means operatively connected between the sleeve and riser for releasably securing the sleeve within the riser; and
abutment means on the water delivery tube at said inner end for projection beyond the outer diameter of said inner end to prevent said inner end from being moved through the sleeve.

3,912,172
SELF ACTUATED PRESSURE LUBRICATED SWIVELLED NOZZLE FOR ROCKET MOTORS
Thomas E. Bolner, Fayetteville, Tenn., assignor to Thiokol Corporation, Bristol, Pa.
Filed May 7, 1971, Ser. No. 141,319
Int. Cl. B64c *15/00*
U.S. Cl. 239—265.35 **11 Claims**

1. An improved lubricated ball and socket swivel joint for the attachment of a steerable exhaust nozzle to the combus-

tion chamber of a rocket motor including, in combination, a lubricant pressure amplifier communicably connected to the combustion chamber and responsive to the pressure therein, means communicably connecting the amplifier to sealed spaced between the ball and socket of the swivel joint, means supplying lubricant to said amplifier, and means for univer-

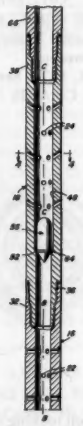


sally swivelling said nozzle including a plurality of actuation expansion chambers between movable and fixed portions of said swivel joint and contained within the joint, a continuous resilient peripheral seal within each expansion chamber, a constant length flexible tension band about and in contact with the perimeter of each seal, and means for selective application of fluid pressure to the chambers.

3,912,173
FORMATION FLUSHING TOOL

Donald F. Robichaux, 312 Swan Ave., Houma, La. 70360

Filed Apr. 25, 1974, Ser. No. 464,612
Int. Cl.² B05B *1/16*
U.S. Cl. 239—443 **4 Claims**



1. A formation flushing tool, comprising, in combination:

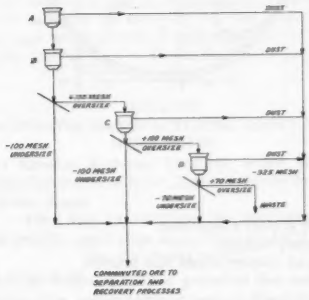
a. nozzle means for simultaneously jetting fluid in a plurality of different directions; and

b. stop means for selectively blocking fluid from jetting from the nozzle means in at least one of the plurality of different directions, the nozzle means including a longitudinal length of pipe divided into a plurality of sections arranged along the longitudinal length of the pipe, each section of said plurality of sections being provided with at least one hole oriented in a direction different from the directions of orientation of holes of all other sections, each section having a longitudinal axis and being provided with a plurality of holes, each hole of a section oriented in a common angular relationship with respect to the longitudinal axis of the respective section, the pipe including three sections, a first section of the three sections being a cylinder having a rounded, enclosed end and a spaced, open end, and arrangeable rounded end first lowermost of the pipe, the rounded end being provided with a pair of holes arranged diametrically opposite one another and at an acute angle with respect to the longitudinal axis of the first section, a second section of the three sections being a cylinder having a pair of spaced, open ends, one of the open ends being connected to the open end of the first section, the cylinder being defined by a cylindrical wall provided with a plurality of holes divided into a plurality of spiral rows and oriented radially with respect to the longitudinal axis of the second section, and a third section of the three sections being a cylinder having a pair of spaced, open ends, one of the open ends connected to the other of the open ends of the second section, the cylinder being defined by a cylindrical wall provided with a plurality of holes divided into a plurality of spiral rows and oriented at an acute angle with respect to the longitudinal axis of the third section and directed away from the second section.

3,912,174
PROCESS FOR PREPARATION ORES FOR CONCENTRATION

Janusz M. Karpinski; John S. Rentschler, and Rodney L. Stone, all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 16, 1974, Ser. No. 515,263
Int. Cl.² B02C *23/14*
U.S. Cl. 241—24 **8 Claims**



1. A method for preparing an ore containing minerals and gangue for separation of said minerals from said gangue and recovery of said minerals as a concentrate of a predetermined grade, said recovery being made at a relatively coarse liberation size, particles of said ore being crushed to a desired size prior to preparation, said method comprising:

a. sizing said crushed ore at a predetermined size to separate said crushed ore into an oversize fraction and an undersize fraction,

b. recycling said oversize fraction to said crushing step,

c. passing said undersize fraction sequentially to a plurality of dry centrifugal impact grinding mills, each of said mills having a rotor which is operated at a predetermined speed to hurl said crushed ore against a target at a velocity whereby said crushed ore attains an impact energy of sufficient magnitude to liberate said minerals from said gangue, said liberation being at a relatively coarse size,

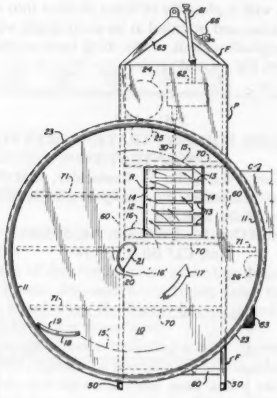
d. collecting said liberated minerals and said gangue as a comminuted product.

e. passing said comminuted product to mineral separation and recovery steps wherein said minerals are separated from said gangue and are recovered as a concentrate of a predetermined grade.

3,912,175
TUB GRINDER

Robert R. Anderson, Greeley, Colo., assignor to Farmhand, Inc., Hopkins, Minn.

Filed Apr. 24, 1974, Ser. No. 463,442
Int. Cl.² B02C *13/04*
U.S. Cl. 241—73 **3 Claims**



1. A tub grinder comprising:

a stationary bottom;

a side wall rotating about said bottom;

a hammer mill including a rotor mounted on a shaft and provided with pivoted hammer means, with screen means on the underside of the periphery of the travel of said hammers as said rotor rotates:

said bottom having an opening in which said rotor is mounted, the axis of said rotor shaft being parallel to but spaced from a radius of said bottom and the path of the outer portions of said hammers being above said bottom, whereby the swath of cut of said hammers on the underside of material moved over said hammers by rotation of said side wall has a width corresponding essentially to the radius of the tub floor;

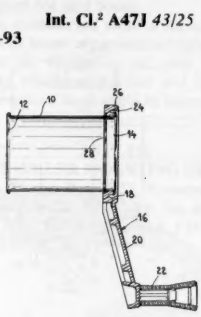
the inside corner of said opening being spaced from the center of said tub bottom and said opposite outside corner of said opening being spaced inwardly from said side wall; and

means adjacent the side wall for deflecting inwardly material moved around said bottom by rotation of said side wall, so as to intersect the swath of said hammers, said outer deflecting means being an arcuate, upstanding baffle mounted on said tub bottom and having its inner end spaced from said side wall a distance corresponding to said outside corner of said opening.

3,912,176
MANUALLY OPERATED KITCHEN GRATER

Jean Mantelet, Paris, France, assignor to Societe Anonyme Moulinex, Bagnolet, France

Filed June 10, 1974, Ser. No. 477,747
Claims priority, application France, June 22, 1973, 73.22809
Int. Cl.² A47J *43/25*
U.S. Cl. 241—93 **3 Claims**

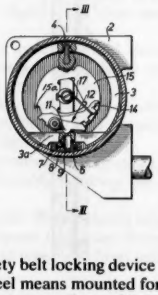


1. A manually operated grater comprising a cylindrical drum of metal which is open at its ends and which has a circular outwardly directed flange on one of its edges, and a plastic hub in the form of a ring fixed to said circular flange and integral with a crank arm extending outwardly from the ring and terminating in a handle, the drum having a circular outwardly directed shoulder spaced from said circular flange, and the ring engaging the outer periphery of the drum between the shoulder and the flange, said ring having peripherally spaced recesses thereon and said flange having protuberances that engage in said recesses thereby to fix the drum and ring against rotation relative to each other.

3,912,177
LOCKING DEVICE FOR VEHICLE SAFETY HARNESSESS

Karl-Ivar Nilsson, Upplands Vasby, Sweden, assignor to AB Instrument-Verken, Sweden

Filed Feb. 11, 1974, Ser. No. 441,117
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 **5 Claims**



1. In a vehicle safety belt locking device for safety harnesses of the type having reel means mounted for rotation in a housing, toothed means connected to said reel means, and pawl means mounted for movement in said housing, a belt being automatically wound on said reel means when not in use, said belt being withdrawn from said reel means when in use, said pawl means being operative to engage said toothed means and lock said reel means against rotation upon rapid changes in vehicle speed or vehicle direction of movement, the improvement comprising:

a supporting surface in said housing;

a pendulum-like member mounted at a first end thereof for freely pivotable motion in all directions above said sup-

porting surface, said pendulum-like member having a planar surface thereon;

a support member disposed between said pendulum-like member and said supporting surface,

said pendulum-like member being supported at a second end thereof by a first end of said support member,

said support member being supported in turn at a second end thereof by said supporting surface; and

cooperating means comprising

recess means disposed in one of said planar surface of said pendulum-like member and said pawl means, and raised means disposed on the other of said planar surface of said pendulum-like member and said pawl means,

said recess means and said raised means being adapted to co-act to move said pawl means into engagement with said toothed means upon swinging movement of said pendulum-like member, thereby to lock said reel.

3,912,178

CRUSHING ROLLER MILL

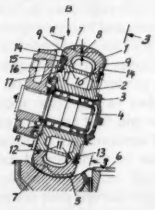
Helmut Grommes, Duisburg, Germany, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,274

Claims priority, application Germany, May 3, 1973, 2322182

Int. Cl.² B02C *15/00*

U.S. Cl. 241—110 **3 Claims**



1. A crushing roll for a mill comprising: a reversible hard shell annular ring with camber, flanks and a U-shaped symmetrical cross section profile wherein the hard shell ring is provided on both faces of the flanks in a mirror image fashion with equal recesses arranged radially and open towards the center, a hub the outer bearing surface of which seats the annular ring, a hub rim extending radially slightly beyond the hub's outer bearing surface, a retaining ring contacting the flanks of the annular ring and the hub so as to co-act with the hub rim to restrain lateral movement, protrusions extending radially outward from the hub so as to surpass the hub rim and engage the recesses in a stress-free manner.

3,912,179

GRINDING MILL FOR NUTS

John W. Hartig, Jr., and Casper W. Showalter, both of Scottsdale, Ariz., assignors to Butternut Corporation, Phoenix, Ariz.

Filed May 1, 1974, Ser. No. 466,003

Int. Cl.² B02C *2/00*

U.S. Cl. 241—248 **9 Claims**

1. A grinding mill for seed and nut meat materials comprising in combination:

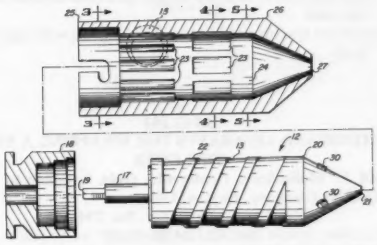
a milling head comprising an elongated rotor having a first power driven end and a second end,

an elongated hollow cylindrical housing,

the hollow interior of said housing defining a cavity the shape of which is similar to the outer configuration of said rotor,

the outer peripheral surface of said rotor being provided with a cutting and grinding means in the form of a spiral which extends from the power driven end of the rotor toward its second end for moving the material toward its second end,

said cutting and grinding means extending above the outer peripheral surface of said rotor a predetermined distance, means for rotatably mounting the cutting and grinding means of said rotor in the hollow interior of said housing, the inside peripheral surface of said housing being provided with indentations along its length which cooperate with said grinding surfaces of said rotor for cutting, grinding and pressing the material being processed as it is moved by said spiral through said head,



said indentations being of a rectangular configuration with their longest sides extending in the direction of the longitudinal axis of the housing,

a first opening in said housing adjacent said second end of said rotor forming a nozzle for discharging the processed material of said head, and

a second opening in said housing adjacent the power driven end of said rotor for receiving into said housing between said rotor and the inside peripheral surface of said housing the seed and nut meat materials to be processed.

3,912,180

APPARATUS FOR MANUFACTURING ANNULAR HELIX WIRE BEADS

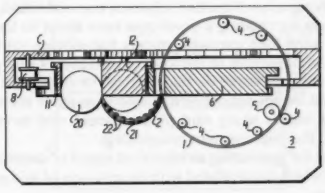
Fuminori Kaneko; Kashirou Ureshino; Ichiro Miyata, and Masahiro Tomita, all of Kobe, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed May 23, 1973, Ser. No. 363,195

Claims priority, application Japan, May 23, 1972, 47-50391

Int. Cl.² B65H *81/02*

U.S. Cl. 242—4 BE **11 Claims**



1. An apparatus for winding a winding wire upon a core wire having an endless form, comprising:

a core wire drive mechanism for rotating the core wire about its axis;

a wire drum for storing said winding wire;

a drum support mechanism for rotatably supporting said wire drum about a first axis;

a rotary body for rotatably supporting said drum support mechanism coplanar therewith about a second axis and

rotating the same around said core wire and through the endless form thereof, said body being provided with a slit for passing said core wire therethrough;

a rotary body drive mechanism for rotating said rotary body;

means for limiting rotation of said wire drum to a single axis with respect to said drum support mechanism;

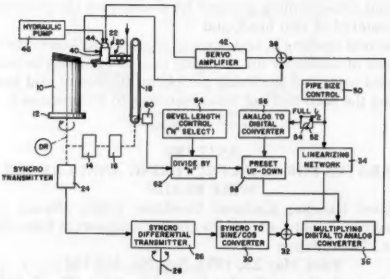
a semi-circular winding wire guide for changing the feeding direction of said winding wire by drawing out said winding wire from the tangential direction of said wire drum in relation to said wire guide, said guide extending between said first and second axes so as to confine the movement of said winding wire to a path extending from said first axis to said second axis in a semi-circular curved line; and

means for synchronously rotating said guide with said rotary body.

3,912,181
METHOD AND APPARATUS FOR WRAPPING A BEVEL PIPE CORE

David L. Mullendore, Centerville, Ohio, assignor to Price Brothers Company, Dayton, Ohio

Filed Oct. 3, 1972, Ser. No. 294,625
Int. Cl.² B65H *81/00*
U.S. Cl. 242—7.02 **4 Claims**



1. In apparatus for wrapping prestressing wire about a pipe core having a bevel portion adjacent one end thereof, including means for rotating a bevel pipe core about its longitudinal axis, a wire feed carriage, means for moving said carriage along a path parallel to the longitudinal axis of said pipe, wire guide means mounted on said carriage to direct wire onto said pipe, and means for oscillating said wire guide means as said carriage moves along said pipe adjacent said bevel portion thereof, the improvement comprising:

a. means for generating an electrical signal of sinusoidal waveform which is correlated with the rotation of said pipe about its axis,

b. means for modifying said sinusoidal signal in accordance with the diameter of the pipe being wrapped by adding thereto an offset voltage,

c. means for generating an electrical signal in accordance with movement of said wire feed carriage,

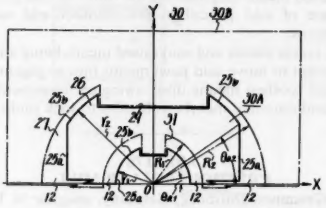
d. means for further modifying said sinusoidal waveform signal to reduce its amplitude as the bevel portion of said pipe is wrapped, and

e. means responsive to said further modified sinusoidal signal for controlling the oscillation of said wire guide means.

3,912,182
APPARATUS FOR WINDING SADDLE-SHAPED DEFLECTION COIL

Yoji Ishikawa, Omiya, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 495,293, Aug. 6, 1974. This application Jan. 30, 1975, Ser. No. 545,738
Claims priority, application Japan, Aug. 21, 1973, 48-93572
Int. Cl.² H01F *11/04*
U.S. Cl. 242—7.07 **3 Claims**



1. An apparatus for winding a saddle type deflection coil for a cathode ray tube comprising:

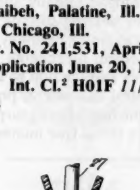
a. a female member having cross-sections in planes perpendicular to a first axis corresponding to the longitudinal central axis of the cathode ray tube, and each of which consists of a pair of half sectional portions substantially symmetrical with reference to a second axis lying in the respective plane and being perpendicular to said first axis, each of said half sectional portions of each cross section including an inner curved margin defined by an arc of a circle with a center at a point on said first axis; and

b. a male member having cross sections in said planes perpendicular to said first axis, and each of which consists of a pair of half sectional portions substantially symmetrical with reference to said second axis and each of the last mentioned half sectional portions including an outer margin having a curved part formed by an arc of another circle with a center at said point on said first axis and a straight part extending parallel with said second axis from said curved part.

3,912,183
COIL WINDING APPARATUS

Hashem M. Gharaibeh, Palatine, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Division of Ser. No. 241,531, April 6, 1972, Pat. No. 3,858,312. This application June 20, 1974, Ser. No. 481,352
Int. Cl.² H01F *11/04*
U.S. Cl. 242—7.08 **11 Claims**



1. Apparatus for forming a coil assembly comprising:

means for capturing a wire comprising two members which cooperate to capture said wire and to form an annular winding arbor;

means for disposing a first end of a flexible, channel-shaped strip of insulating material on said arbor adjacent the captured wire; and

means for applying a first turn of said wire about said strip beginning at said first end and progressing therealong so as to retain the strip against said arbor to define a bobbin of annual configuration, and applying a preselected number of additional turns of said wire about said annular bobbin to form an annular coil coaxially carried by said bobbin.

3,912,184
CONTROL OF YARN TENSIONS

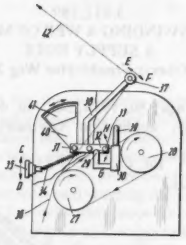
Karl Bous, Sternstr. 74, 56 Wuppertal 2, Germany

Filed Sept. 19, 1973, Ser. No. 398,690

Claims priority, application Germany, Sept. 19, 1972, 2245869

Int. Cl.² B65H *51/20*

U.S. Cl. 242—47.01 **3 Claims**



1. In a device for delivering yarn under desired, substantially constant tension to a zone of yarn use, the combination comprising two spaced delivery rollers about which such yarn runs in several windings, at least one of said delivery rollers being a drive roller, three braking surfaces disposed between said rollers and arranged parallel to each other and to the delivery rollers, said yarn passing alternately above and below said three surfaces in constant slidable contact therewith in the normal yarn delivering operation, the two outer braking surfaces being fixedly positioned; the middle braking surface disposed between said outer surfaces being movable relative thereto; said movable middle surface effecting various pressures on the yarn engaged thereby; said pressures being dependent upon said movable middle surface disposition relative to said outer surfaces; means urging said movable braking surface in the direction of and between said fixed braking surfaces so as to increase the looping angle of the engaged yarn about said movable braking surface and increase the tension of said yarn caused by said movable braking surface; increased tension in the yarn in the zone of use forcing said movable braking surface to withdraw from between the fixed braking surfaces whereby the looping angle of the engaged yarn about said movable braking surface is decreased and the tension in said yarn caused by said movable braking surface is decreased; said middle braking surface comprising a brake pin, a pivotally movable lever fastened to said brake pin and movable about a pivot axis disposed parallel to said pin, an adjustable spring engaging said lever, said spring effecting the movable brake pin contact pressure with such yarn, a compensation arm mounted on said lever having a thread guide roll arranged on its distal end, which roll is encircled in part by yarn emerging from the device in such a way that the yarn tension counteracts the tension in said spring-engaging lever.

3,912,185
DEVICE FOR WRAPPING YARN AROUND NELSON ROLLERS

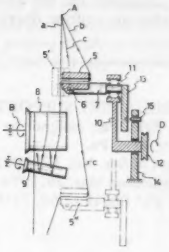
Kiyomi Yamada, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,531

Claims priority, application Japan, Jan. 12, 1973, 48-6863

Int. Cl.² B65H *51/26*

U.S. Cl. 242—47.03 **6 Claims**



1. A device for wrapping yarn around nelson rollers, or a pair of rollers with their axes arranged side by side but spaced apart wider at their free ends than at the supporting ends and rotating together, comprising a wrapping guide having an end from which the yarn leaves for movement toward said pair of rollers, said end of said guide is located above and on a plane extending through a point on the pair of rollers which is a given distance inward from the free ends thereof, said guide being rotatable about said rollers to wrap the yarn thereabout, the yarn being delivered from a position above said rollers and guide to said rollers near said point and after being wrapped extending from said supported ends, means for rotating said guide about said rollers including a rotatable arm, a spindle rotatably attached at one end of said arm, and a means for rotatably driving said arm attached at the other end, a weight mounted on said spindle near the end supported by said arm, and said guide mounted at the other end of said spindle.

3,912,186
AIR-CUSHION WINDING MACHINE

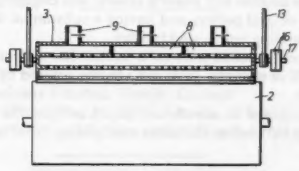
Rolf Bruck, Opladen, and Kurt Meister, Leichlingen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 6, 1973, Ser. No. 386,015

Claims priority, application Germany, Aug. 12, 1972, 2239778

Int. Cl.² B65H *23/24*

U.S. Cl. 242—55 **9 Claims**



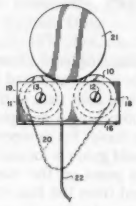
1. An arrangement for winding sheet material onto a roll, comprising a radially displaceable structure extending over the entire width of the sheet, the structure being arranged above the roll, a radial force reacting against the structure and urging it towards the roll, the bottom of the structure having a substantial area and being provided with a plurality of openings which allow an air stream to be directed onto the surface

of the roll which compensates for the radial force on the structure and keeps it from contact with the roll on an air cushion which causes the sheet material to be uniformly wound on the roll, the bottom of the structure comprising an elastic material having through perforations, the structure contains a plurality of laterally disposed air chambers, separate air supply lines connected to each of the laterally disposed air chambers, a plurality of openings from the air chambers, and a slotted plate arranged in the structure between the outlets from the air chambers and the air-outlet openings in the elastic material whereby uniform distribution of the air is provided.

3,912,187
ROLL SHEET SUPPORT

Conrad G. Woelky, Erie, Pa., assignor to The BD Paper & Specialty Company, Erie, Pa.

Continuation-in-part of Ser. No. 355,805, April 30, 1973, abandoned. This application Mar. 29, 1974, Ser. No. 456,138
Int. Cl.² B65H *17/08, 75/18*
U.S. Cl. 242—66 **3 Claims**



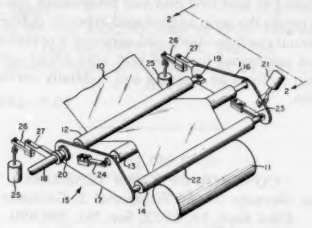
1. A paper roll support made up of two spaced roller members,
said roller members having their longitudinal axes disposed in generally parallel relation with each other,
a roll of sheet material supported on said roller members with the axis of said roll of sheet material being generally parallel to the axis of said rollers,
siad roll of sheet material having a diameter greater than the spacing of said rollers,
each said roller having a shaft extending from each of its ends,
a first bracket and a second bracket,
said brackets receiving the ends of said shafts whereby said rollers are supported in parallel relation with each other, said brackets having means thereon for attaching them to a support member adjacent a ceiling of a room,
a first pulley fixed to said frist roll,
and a second pulley fixed to said second roll,
and an endless belt passing around and engaging the periphery of said pulleys and having a substantial slack portion extending below said pulleys,
said belt extending down a substantial distance from said pulleys whereby said rolls may be rotated by pulling said belt,
to reroll and to unroll siad paper an operator can pull on said belt below the other said pulley.

3,912,188
DAMPED FLEXURE MOUNTS FOR USE IN WEB WINDING

Raymond Marvin Ballard, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1974, Ser. No. 500,496
Int. Cl. B65h *23/10*
U.S. Cl. 242—75.2 **11 Claims**

1. In a machine for continuously winding a web onto a wind-up roll comprising a lay-on roll in contact with the surface of the wind-up roll, the improvement wherein said lay-on roll is mounted within a frame by damped flexure mounts supporting the ends of said lay-on roll , one end of said flexure

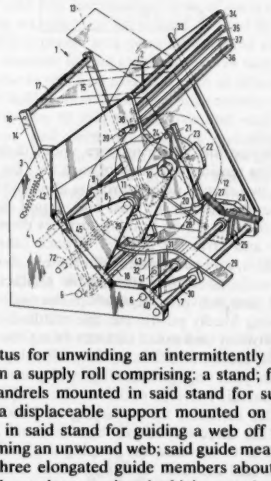


mounts being attached to said frame and the other end being attached to the ends of said roll by resilient attachments, said flexure mounts having a plurality of alternating spring steel leaves and leaves of polymeric material.

3,912,189
DEVICE FOR UNWINDING A WEB OF MATERIAL FROM A SUPPLY ROLL

Everhard Bauer, Oberer Frankfurter Weg 21, 479 Paderborn, Germany

Filed Apr. 30, 1974, Ser. No. 465,726
Claims priority, application Germany, May 9, 1973, 2323430
Int. Cl.² B65H *25/22*
U.S. Cl. 242—75.43 **17 Claims**

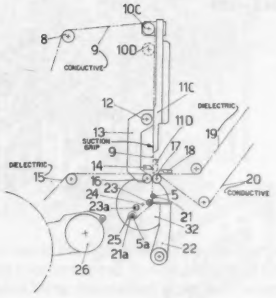


1. Apparatus for unwinding an intermittently fed web of material from a supply roll comprising: a stand; freely rotatable stub mandrels mounted in said stand for supporting a supply roll; a displaceable support mounted on said stand; guide means in said stand for guiding a web off said supply roll, thus forming an unwound web; said guide means comprising at least three elongated guide members about which the unwound web can be passed and which extend substantially parallel to the rotary axes of said stub mandrels, two of said guide members being mounted at fixed locations in said stand and a third of said guide members being mounted on said displaceable support for movement within limits towards and away from said two guide members whereby to shorten and lengthen, respectively, a loop of the unwound web extending between said third guide member and said two guide members; means for urging said third guide member away from said two guide members; clamping means for releasably holding said stub mandrels to said supply roll; brake means operatively connected to one of said stub mandrels; and means effective to apply said brake means when said third guide member is at its said limit of movement away from said two guide members.

3,912,190
AUTOMATIC MACHINE FOR MANUFACTURING ELECTRIC CAPACITORS

Robert Finck, 40 Route de Troyes, Talant, France

Filed Jan. 13, 1972, Ser. No. 217,500
Claims priority, application Italy, Jan. 23, 1971, 3317/71
Int. Cl.[2] H01G *13/02, 7/00;* **B65H** *39/16*
U.S. Cl. 242—56.1 **9 Claims**



1. A machine for the automatic manufacture of electric capacitors with interleaved pairs of dielectric strips and conductive strips wound into a coil, comprising:

a support provided with rotatable winding means;

a pair of coacting guide members forming an entrance throat in line with said winding means;

supply means for delivering two dielectric strips and an outer conductive strip to said guide members over separate paths converging at said entrance throat;

reciprocable feed means intermittently engageable with an inner conductive strip for delivering a leading end thereof to said entrance throat between said dielectric strips for frictional entrainment thereby past said guide members to said winding means whereby said dielectric and conductive strips are interleaved in a stack of strips engageable by said winding means for being wound into a coil;

first cutting means upstream of said guide members for severing said inner conductive strip independently of the other strips of said stack; and

second cutting means downstream of said guide members for severing the remainder of said stack at a point beyond the trailing end of said inner conductive strip whereby the ends of said inner and outer conductive strips are relatively staggered in said coil.

3,912,191
TAPE TENSIONING CONTROL ASSEMBLY

Andrew W. Anderson, West Caldwell; Martin E. Leszczynski, Jersey City, and Milan Mateyka, Union, all of N.J., assignors to Scandia Packaging Machinery Company, Clifton, N.J.

Filed Apr. 18, 1974, Ser. No. 462,057
Int. Cl.[2] B65H *25/22*
U.S. Cl. 242—75.43 **6 Claims**

1. A tension control and brake assembly for maintaining tension on a relatively thin pliant strip material between a rotatively mounted supply spool and means for drawing the strip material from the spool and for braking the spool in response to a reduction of tension in the drawn material below a predetermined level, said assembly comprising:

a. a rotatively mounted spool support element having an annular braking surface thereon,

b. a tension control arm pivotally mounted coaxially of the spool support axis of rotation,

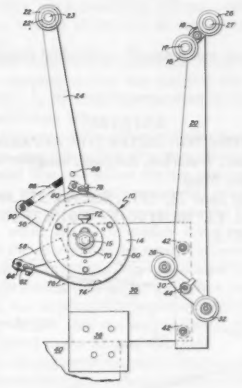
c. brake means including a brake element connected to said tension control arm and engageable with said annular braking surface upon pivotal movement of the control arm in a first direction to brake the spool support element,

d. said brake element tending to disengage said braking surface upon pivotal movement of the control arm in the opposite direction thereby regulating the tension of the withdrawn strip material,

e. biasing means connected to urge said arm in its brake engaging direction,

f. a first strip guiding means mounted on said control arm remotely from the pivotal mounting thereof,

g. a second strip guiding means mounted in spaced relation to said first guiding means in a direction corresponding to the tension regulating opposite movement of the control arm, and



h. a third strip guiding means mounted in spaced relation to the first guiding means and in a direction opposite from the braking direction of control arm movement,

i. said second guiding means being adapted to receive and guide an initial portion of the strip material withdrawn from the spool,

j. said first guiding means on the tension control arm being adapted to receive and guide the withdrawn strip material from the second guiding means,

k. said third guiding means being adapted to receive and guide the withdrawn strip material from said first guiding means for delivery to the strip drawing means whereby the tension applied to the strip material is multiplied in its brake releasing application to the first guiding means and tension control arm.

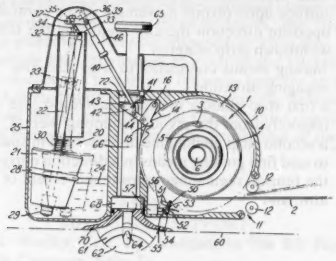
3,912,192
RESTRAINING DEVICE

Albert J. W. Shirley, Slough, England, assignor to M. L. Aviation Company Limited, Slough, England

Filed May 20, 1974, Ser. No. 471,831
Claims priority, application United Kingdom, May 25, 1973, 25162/73
Int. Cl.[2] B65H *75/34;* **B64F** *1/12*
U.S. Cl. 242—107.4 **4 Claims**

1. In a restraining device of the type comprising a drum, means mounting said drum for rotation, a strop-like flexible member wound on said drum, spring means connected to turn said drum in a direction to wind up said flexible member and a ratchet control mechanism, said mechanism including a ratchet wheel turning with said drum, a pawl cooperating with said ratchet wheel, a hydraulically damped pendulum and means connecting said pendulum to said pawl whereby said pawl is moved into engagement with said ratchet wheel when

said pendulum swings through more than a predetermined angle, the improvement which comprises a second pawl for



locking said drum and manually controlled means for operating said pawl.

3,912,193

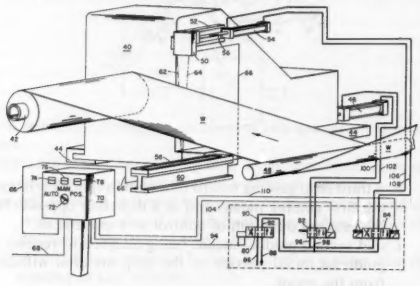
WEB POSITION DETECTOR APPARATUS

Albert J. Calvaer, Waterloo, Belgium, assignor to Knox, Inc., South Walpole, Mass.

Filed June 21, 1973, Ser. No. 372,307

Int. Cl.[2] B65H *25/26;* **G01N** *21/30*

U.S. Cl. 242—57.1 **8 Claims**



1. Web position detecting apparatus for controlling the operation of a device for regulating registry of a traveling web with equipment operating thereon which causes, at least in a zone along the path of said web, substantial variation in the position of said web along an axis intersecting the plane of said web, said device having operating means for producing opposite relative position adjustment movements of said web and said equipment along a direction transverse to the direction of web movement, said apparatus comprising:

detector means for association with a web to detect opposite deviation movements thereof from a path of registry and to cause said corresponding adjustment movements by said operating means;

said detector means comprising a laser beam emitter and a receiver for said beam, said receiver provided with sensing means capable of accurately sensing changes in the amount of said beam received thereby substantially independently of changes in the ambient light;

means for mounting said emitter in a first position fixed in the direction of said axis for directing said beam at the web edge in said zone so that at predetermined positions of the web said beam is partially blocked thereby and for mounting said receiver in a second position fixed in the direction of said axis for receiving the portion of said beam unblocked by the web; said fixed positions being at opposite ends of an optical path a multiplicity of feet long to accommodate the maximum said variation in said position of said web along said axis in said zone and

means for producing from said changes sensed by said sensing means said adjustment movements by said operating means.

3,912,194

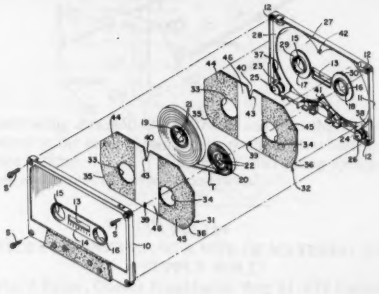
TAPE CASSETTE WITH TAPE CLEARANCE SPACE

John Y. S. Chan, 24965 Huron St., Loma Linda, Calif. 92354

Filed June 21, 1974, Ser. No. 481,766

Int. Cl.[2] G03B *1/04;* **G11B** *15/32, 23/04*

U.S. Cl. 242—199 **3 Claims**



1. A tape cassette, including opposed, mating housing portions having means on the confronting inner surfaces thereof to rotatably support a pair of tape spools on which a recording tape is wound, said housing portions having recesses in the inner surfaces thereof of a size to substantially completely underlie the tape when the tape is wound on the spools and providing a lateral clearance space for the tape in the event the tape is inaccurately wound on the spools, to thus prevent binding of the tape in the housing portions, a deflector plate supporting shoulder on each housing portion extending around the recess and a deflector plate supporting shoulder on each housing portion surrounding each spool mounting means, and resiliently yieldable tape deflector plates carried by the housing portions between the tape and recesses and supported on the shoulders in overlying relationship to the recesses to engage opposite sides of the tape and thus urge the tape to wind accurately upon the spools.

3,912,195

TAPE TRANSPORT DEVICE FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

Hideharu Yamamoto, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 16, 1974, Ser. No. 433,788

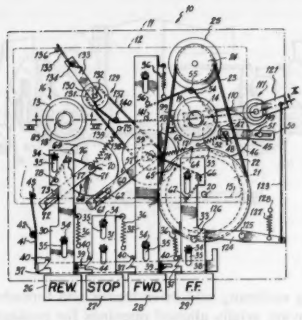
Claims priority, application Japan, Jan. 19, 1973, 48-8814; Jan. 19, 1973, 48-8816

Int. Cl.[2] G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—201 **10 Claims**

1. In a tape recording and/or reproducing apparatus, a tape transport device having at least a normal-forward operating mode in which a tape is withdrawn from a supply reel and wound on a take-up reel; said tape transport device comprising an electrically operating motor, tape drive means connected with said motor and operative in said normal-forward operating mode for driving the tape at a constant speed from said supply reel toward said take-up reel, reel drive means for applying torque to said take-up reel in the direction for winding the tape thereon and including fluid coupling means having a driven member adapted to be rotatably coupled to said take-up reel, a rotatable driving member and a body of liquid contacted by said driven and driving members for transmitting said torque therebetween, means for varying the distance between said driven and driving members in response to temperature change so as to compensate for changes in the viscos-

ity of said liquid resulting from said temperature changes, and intermediate transmission means operative by said motor in said normal-forward operating mode for rotating said driving



member so as to wind the tape on said take-up reel as the tape is driven at said constant speed by said tape drive means with a constant tension being maintained in the tape irrespective of said temperature changes.

3,912,196

TAPE TRANSPORT FOR RECORDING AND PLAYBACK APPARATUS, ESPECIALLY FOR TEACHING MACHINES

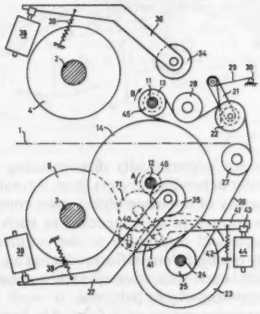
Gerhard Kreutze, Bammental; Manfred Moessner, Eppelheim; Guenther Obstfelder, Leimen; Gerhard Soehring, Dossenheim, and Victor Pfirrmann, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 29, 1973, Ser. No. 346,088

Claims priority, application Germany, Mar. 29, 1972, 2215295

Int. Cl.² G11B *15/22, 15/29, 15/30*

U.S. Cl. 242—204 **6 Claims**



1. In a tape transport which is particularly designed for use in a teaching apparatus and which includes:

a. two drive spindles upon which supply and take-up spools of tape can be mounted;

b. two capstans;

c. a capstan interconnecting means to cause said capstans to simultaneously rotate in opposite directions at the same speed of rotation; and

d. two movable, individually electromagnetically actuatable, pressure rollers, each of said rollers being arranged to urge said tape against one of said oppositely rotating capstans upon actuation of said pressure roller; the improvement which comprises: combining with said elements *a* to *d*

e. two drive pulleys of different diameters, the drive pulley of larger diameter being coaxially mounted on the first of said two capstans and the drive pulley of smaller diameter being coaxially mounted on the second of said two capstans, each of said drive pulleys being mounted for rotational movement coaxial with but free of its associated capstan;

f. two individually actuatable coupling devices, each of said coupling devices being arranged for coupling when actuated, a respective capstan to said associated drive pulley mounted thereon for synchronous rotation thereof;

g. a drive pulley interconnecting means to cause said drive pulleys to rotate at different speeds dependent on their respective different diameters when driven by a drive means; and

h. a drive means consisting of a single motor for driving said drive pulley interconnecting means, whereby said capstans are rotated when one of said coupling devices is actuated;

and in a first condition of operation when upon actuation the first coupling device has coupled the large-diameter drive pulley to the first capstan, and the second coupling device not being actuated,

said large-diameter drive pulley rotating the first capstan at a first low speed in a first direction of rotation and transferring said first low speed via the capstan interconnecting means to the second capstan for rotation in the second direction of rotation opposite to the first direction of rotation while the drive pulley interconnecting means transfers the rotation to the smaller diameter drive pulley for rotation around the second capstan and

in a second condition of operation, when the first coupling device is not actuated and upon actuation of the second coupling device the smaller diameter drive pulley has been coupled to the second capstan,

said smaller diameter drive pulley rotating the second capstan at a second higher speed in said second direction of rotation and transferring via the capstan interconnecting means the second higher speed to the first capstan while the drive pulley interconnecting means transfers the rotation to the smaller diameter drive pulley for free rotation around the said first capstan.

3,912,197

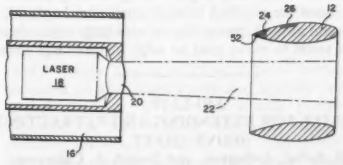
LASER-GUIDED RING AIRFOIL PROJECTILE

Gary L. McKown, Bel Air, and Leonard R. Ambrosini, Churchville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 27, 1973, Ser. No. 419,322

Int. Cl.² F41G *7/00;* **F42B** *15/00*

U.S. Cl. 244—3.13 **9 Claims**



1. In a system for guiding, along a predetermined path, a projectile of the type which spins about its flight axis comprising:

means for launching the projectile along said path;

means for emitting a beam of pulsed monochromatic light along said predetermined path so as to impinge on the projectile;

means mounted on the exterior of the projectile for generating a signal when illuminated by said light beam; and,

means disposed within the projectile for controlling the direction of flight of the projectile in response to said signal, the improvement wherein:

said generating means comprises at least one photosensor disposed on the projectile a predetermined distance from said flight axis, whereby said spinning photosensor describes a circle of predetermined area; and said light beam emitting means comprises a laser system disposed at the launch site including means for varying the cross-sectional area and the divergence of the beam in such a manner that the cross-sectional area of the beam is smaller than the area of said circle at the launch site and is equal to the area of said circle at a predetermined distance from the launch site.

3,912,198

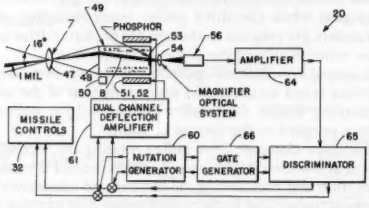
TRACKING SYSTEM

Charles C. Dell, Grand Prairie; A. D. Harms, Jr., Hurst; Albert B. Knowles, Arlington; Fred D. Meredith, Arlington, and Spurgeon Sutherland, Arlington, all of Tex., assignors to LTV Aerospace Corporation, Dallas, Tex.

Filed Nov. 4, 1964, Ser. No. 409,007

Int. Cl. F42b *15/02*

U.S. Cl. 244—3.16 **14 Claims**



1. A tracking system including: a device having means providing a surface on which light from a predetermined optical field may be focused, said means emitting electrons at each point of said surface in accordance with the intensity of light impinging thereon, an anode, and means for focusing electrons emitted from a small area of said surface on said anode; moving means for continuously changing in a predetermined manner the position of said small area of said surface from which emitted electrons are focussed on said anode; and means and operatively associated with last mentioned means responsive to the intensity of the emitted electrons focussed on said anode for causing the position of said small area to be within a large area of said surface on which impinges light of an intensity different than that of the light impinging on areas of said surface about said large area by causing said moving means to move the position of said small area back into said large area and away from an edge of said large area when said small area tends to move past an edge of said large area.

3,912,199

APPARATUS FOR EXTENDING AND RETRACTING A DRIVE SHAFT

Charles M. Seibel, Arlington, and Joseph A. Canavespe, Fort Worth, both of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 22, 1974, Ser. No. 462,889

Int. Cl.² B64C *27/32, 27/52*

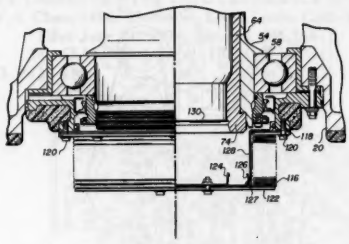
U.S. Cl. 244—17.11 **14 Claims**

1. In a helicopter drive train having a mast supporting a rotor for rotation thereof and temporarily anchored against rotation, the combination comprising:

an externally threaded section extending along the length of said mast as a part thereof;

an internally threaded sleeve encircling said mast and engaging the externally threaded section;

drive means coupling a power source to said sleeve for imparting rotation thereto to extend and retract said mast through the sleeve;



a housing enclosing said drive means and threaded sleeve and having axially aligned openings for passage of said mast when extending and retracting; and

sealing means attached to one opening of said housing and expandable to accommodate the mast retraction.

3,912,200

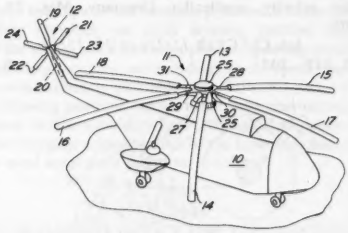
SELECTIVE ROTOR BLADE SEVERING APPARATUS

Marvin J. Foral, Doylestown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1974, Ser. No. 492,370

Int. Cl.² B64C *27/00*

U.S. Cl. 244—17.11 **17 Claims**



11. Apparatus for automatically disconnecting a pair of unbalanced radially depending objects from a rotating member having a plurality of opposing object pairs comprising:

control means formed to be connected to each opposing pair of objects and responsive to the occurrence of a discontinuity of object length for producing a plurality of output signals, each indicative of such occurrence in a respective opposing object pair; and

a plurality of severing means each formed to be connected to a respective opposing object pair, and connected to receive a corresponding output signal for actuatiion thereof upon the occurrence of a discontinuity in the object associated with an opposing object pair.

3,912,201

AIRCRAFT

Charles Bradbury, Hatfield, England, assignor to Hawker Siddeley Aviation Limited, England

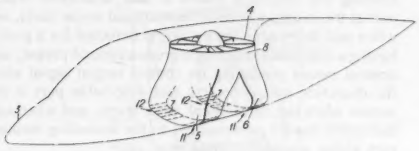
Filed Sept. 13, 1972, Ser. No. 288,728

Int. Cl.² B64C *15/06*

U.S. Cl. 244—23 D **6 Claims**

1. A lifting power plant for a V/STOL aircraft, comprising a single jet lift unit having forward and rear downwardly-

directed efflux discharge ducts and a downwardly-directed exhaust trunk which is bifurcated to connect with said discharge ducts, each said duct having two generally downwardly-directed nozzles disposed laterally side by side, said nozzles being symmetrically disposed about a vertical axis extending



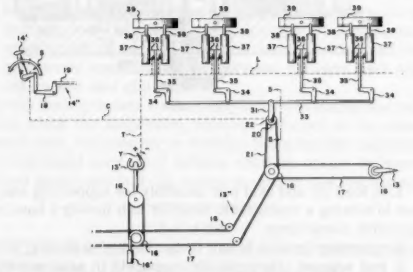
through the center of gravity of said aircraft, and each said nozzle being equipped with efflux-direction-controlling means selectively operable to deflect the efflux from its respective nozzle only in a plane substantially at right angles to the fore and aft axis of the aircraft.

3,912,202

SIDE FORCE CONTROL FOR AIRPLANES

Michael W. M. Jenkins, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 17, 1974, Ser. No. 479,878
Int. Cl.² B64B *15/08*
U.S. Cl. 244—52 **6 Claims**



1. A side force control for an airplane having at least one fan jet engine with a by-pass air duct and pilot operated ailerons and flaps to control flight maneuvers of the airplane, comprising:

a deflector mounted adjacent the aft end of each engine for pivotal movement about a vertical axis with respect to the line of flight of the airplane, each said deflector including a single vane pivotally connected to and extending aft from each engine exhaust nozzle and a pair of diametrically opposed vanes pivotally connected to and extending aft from said by-pass air duct;

an actuator operatively connected to each deflector to effect the pivotal movement aforesaid whereby the angular position of said deflector is adjusted and the engine exhaust is direct accordingly thereby, each said actuator including a hydraulic cylinder carried by the associated engine with the extendable and retractable outer end thereof pivotally connected to one end of each said vane;

a normally disengaged connection between each said actuator and the pilot operated ailerons aforesaid; and

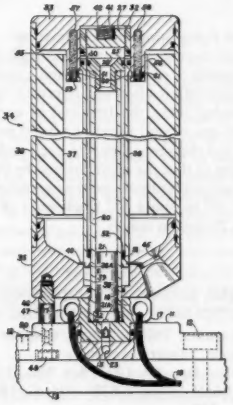
a clutch operable upon movement of said flaps by the pilot to a predetermined position to engage said normally disengaged connection whereby each said deflector is angularly adjusted thereafter concurrently with the movement of said ailerons.

3,912,203

ROCKET CATAPULT AIRCRAFT ESCAPE ARRANGEMENT

Leonard A. De Stefano, Upper Darby, and Osyp Nimlowycz, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1974, Ser. No. 538,300
Int. Cl.² B64D *25/08*
U.S. Cl. 244—122 AD **5 Claims**



1. In an aircraft emergency escape system having a pedestal attached to an aircraft support member and supporting a rocket catapult assembly,

said rocket catapult assembly having a booster tube slidably mounted relative to said pedestal,

said booster tube having a launcher propellant cartridge in a rearward end thereof and a centrally apertured, enlarged piston member secured to its forward end,

a launch tube slidably receiving said piston member and having an inwardly directed flange at its rearward end for abutting said piston member and lateral openings in its forward end,

a rocket motor having a forward head portion slidably mounted on said launch tube and initially covering said lateral openings, a rearward nozzle portion slidably mounted on said booster tube, and an intermediate rocket grain tubular portion, said head portion carrying an auxilliary igniter, said nozzle portion having a central recess slidably receiving a rearward portion of said launch tube,

rupturable means initially securing said rocket motor to said pedestal,

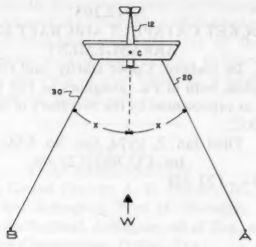
a shear ring on said launch tube initially precluding forward longitudinal motion of said rocket motor on said launch tube, and

means on said booster tube for connection to a pendant line of a seat occupant's shoulder harness.

3,912,204
CAPTIVE AIRFOIL APPARATUS

Robert B. Wheat, 1768 Crestridge, and Roy D. Wheat, 1202 Oriole Lane, both of Garland, Tex. 75042

Continuation-in-part of Ser. No. 383,330, July 27, 1973, abandoned. This application July 18, 1974, Ser. No. 489,502
Int. Cl.² A63H 27/08
U.S. Cl. 244—154 5 Claims

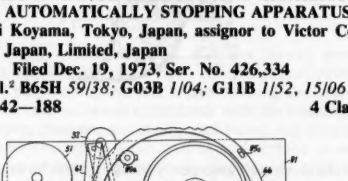


1. Tethered flying apparatus comprising:
a. an aircraft having substantially laterally extending airfoil wings capable of producing lift and a center of gravity aft of the center of lift when said aircraft is in level flight, and
b. two tether lines, the first end of each tether line attached to one of said wings at a point near the outer end thereof and the second end of each tether line held at a fixed point so that the angle formed by the intersection of each of said tether lines and the centerline of said aircraft is about 30° to about 45° when each of said tether lines is about 20 feet in length.

3,912,205
RECORDING AND/OR REPRODUCING APPARATUS WITH AUTOMATICALLY STOPPING APPARATUS

Tsuneyuki Koyama, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Dec. 19, 1973, Ser. No. 426,334
Int. Cl.² B65H 59/38; G03B 1/04; G11B 1/52, 15/06
U.S. Cl. 242—188 4 Claims

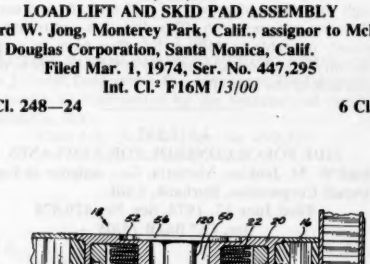


1. A recording and/or reproducing apparatus having an automatically stopping capability, said apparatus comprising:
a tape structure wound at two ends thereof respectively around supply and take-up spools, means for driving said tape in forward and reverse directions depending on the operational mode of the apparatus, said tape structure comprising a tape recording medium part and detectable tape leader parts respectively fixed to the two ends of the recording medium part, said leader parts being anchored to the hubs of said supply and take-up spools;
operation means for manipulatively changing over the apparatus from its stopped mode to its operational mode;
detection means for discriminatingly detecting the recording medium part and the detectable leader parts of the tape structure;
control means for producing a control output signal when the detection means detects a change of the tape structure while it is traveling during the operational mode of the apparatus, said control means producing the control output signal when said part of the tape structure confronting the detection means is said detachable leader part at the instant when said operational mode starts, and when said detectable leader part is detected for a period having a duration exceeding a predetermined period, said control means producing no control output signal when the detection means detects said detectable part at the instant when the operational mode starts, and when said detectable leader part changes to the recording medium part within a predetermined time; and
mode changing means operating in response to said control output signal to change over the apparatus from the operational mode to the stopped mode.

3,912,206
LOAD LIFT AND SKID PAD ASSEMBLY

Howard W. Jong, Monterey Park, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Mar. 1, 1974, Ser. No. 447,295
Int. Cl.² F16M 13/00
U.S. Cl. 248—24 6 Claims

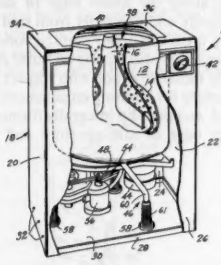


1. A load lift and skid pad assembly for supporting and for use in moving a replaceable modular unit having a base, said assembly comprising:
a mounting for attachment to the base of said unit,
a pad support telescopically insertable in said mounting, said pad support having an extended position and a retracted position, and
resilient means urging said pad support to said extended position,
said mounting having an opening therethrough for insertion of a fastener to cause said pad support to be in its retracted position,
said mounting having a top annular plate, an inner fastener guide wall extending downwardly therefrom, and an outer rim extending downwardly from said plate,
said resilient means being a plurality of stacked Belleville springs around said guide wall and within said outer rim, said springs bearing against said top annular plate and against said pad support to urge said pad support to its extended position,
said inner fastener guide wall defining said opening in said mounting through which the shank of a fastener may be passed in moving said pad support to its retracted position.

3,912,207
SHIPPING MOUNT AND SUSPENSION SYSTEM FOR APPLIANCE

Joseph August Gauer, Buchanan, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 30, 1974, Ser. No. 493,028
Int. Cl.[2] B65D *19/40*; F16F *15/06*
U.S. Cl. 248—25 11 Claims



1. A combined suspension and hold-down element for an appliance having a suspended tub assembly and a base, and designed to stand on a supporting surface, said suspension and hold-down element comprising:

a suspension member having opposite first and second end portions and a free state and a fully compressed state, said suspension member connected between said suspended portion and said base of the appliance; rod means restrained relative to said first end portion and extending toward said second end portion of said suspension member;

clip means associated with said second end portion of said suspension member for releasably gripping said rod means and responsive to relative rotation between said rod means and said clip means to release said rod means; and

a foot member for supporting the appliance on a supporting surface, including means for selectively permitting the engagement of said rod means by said clip means and for selectively causing relative rotation between said rod means and said clip means,

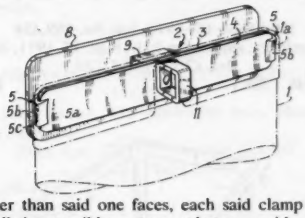
whereby the clip means is selectively caused to engage the rod means when the suspension member is forced to its compressed state, said suspension member being thereby locked in its compressed state until relative rotation occurs between said rod means and said clip means to release said rod means.

3,912,208
DEVICE FOR STORING AND PACKAGING MATERIALS

Roger Grenetier, 22, rue du Hameau, Paris, France

Filed May 10, 1973, Ser. No. 358,905
Claims priority, application France, July 23, 1972, 72.18241; Feb. 23, 1973, 73.06605
Int. Cl.[2] B65B *67/12*
U.S. Cl. 248—99 8 Claims

1. A bag holding device for removably supporting a flexible bag having a mouth with its mouth normally in the closed position, said device comprising a pair of relatively long and narrow strips of flexible, resilient material of substantially equal length, each of said strips having a pair of side edges extending in the direction of its length, a pair of opposite faces extending from one side edge thereof to the other side edge thereof and a pair of end edges at its longitudinally opposite ends, and at least a portion of one said face of each strip being convex in a cross-section taken transversely of the length of the strip, holding means holding said strips together with their lengths extending substantially parallel, with said one face of one said strip facing said one face of the other said strip and with the convex portion of said one face of one said strip in contact with the convex portion of said one face of the other said strip along a line extending lengthwise of said strips, said holding means comprising a pair of deformable U-clamps, one at one of the ends of said strips and the other at the other ends of said strips engaging and connecting said strips together but permitting said strips to bend away from each other intermediate their ends to provide space therebetween for permitting said bag to be passed therebetween in a direction transversely of the length of said strips, said strips when so bent away from each other being readily separable from said bag to permit removal thereof from between said strips, said U-clamps forming a hinge between and at the ends of said strips and each of said U-clamps having a pair of arms engaging the faces of the

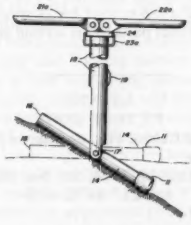


strips other than said one faces, each said clamp having a substantially inextensible centre part between said arms which forms the hinge axis, extends transversely relative to the length of said strips, and is situated very close to the adjacent end of the strips, each of said arms of each of said U-clamps being firmly fixed to a corresponding one of said strips, and mounting means for attaching one of said strips to a support, said mounting means engaging said last-mentioned one of said strips midway of its length, whereby a bag may be inserted and removed from between said strips at its mouth by spreading said strips apart and by moving said bag with respect thereto and whereby a bag will normally be held closed at its mouth by said strips when they are released due to the resiliency of the strips which urges the one faces thereof into contact.

3,912,209
COMBINATION CANE AND PORTABLE SEAT ARTICLE

Andrew Turpin, 253 Poplar St., Wilkes Barre, Pa. 18702

Filed Nov. 18, 1974, Ser. No. 524,479
Int. Cl.[2] A45D *19/04*
U.S. Cl. 248—155.1 3 Claims



1. In a combination cane and portable seat article having an upper portion and a lower portion, wherein the upper portion of said article is selectively alterable to form an apertured handle of a cane or to form an opened seat, the improvement in said lower portion comprising

a. a first, hollow, generally cylindrically shaped member having one end thereof affixed to said upper portion, said member having an axial cut-away portion formed from an intermediate point of said member to an end opposite to said one end thus forming a hollow recess therewithin;

b. a second, hollow, generally cylindrically shaped member adapted to fit within said hollow recess of said first member;

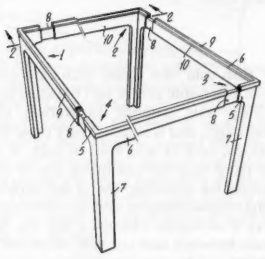
c. means for pivotally supporting an intermediate point of said second member at said opposite end of said first member; and

d. means for selectively retaining said second member within said hollow recess of said first member so that said first and second members are rigidly co-axial, or for permitting said second member to be free to pivot about said intermediate point with respect to said opposite end of said first member.

3,912,210
COMPOSABLE SUPPORT STRUCTURE FOR TABLES AND THE LIKE

Olaf von Bohr, Milan, Italy, assignor to Kartell S.p.A., Milan, Italy

Filed Sept. 15, 1972, Ser. No. 289,454
Claims priority, application Italy, Sept. 15, 1971, 28668/71
Int. Cl.² F16M *11/20*
U.S. Cl. 248—188.1 **12 Claims**



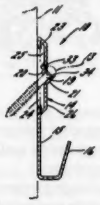
1. An assemblable table structure comprising a support frame for a working surface having four corners with legs at each of said four corners, said structure having four parts adapted to be connected together to define said support frame and said legs, said four parts each comprising three mutually perpendicular arms, the first and second of said arms lying in a first plane and forming a portion of said support frame, said first arm being longer than said second arm, the third of said arms lying in a second plane perpendicular to said first plane and forming one of said legs, the third arm of each of said four parts being of the same length, each of said arms of said four parts comprising a tubular shell formed by external and internal half-shells, and a tenon joint for connecting the first arm of each one of said four parts to the second arm of another one of said four parts.

3,912,211
PICTURE HOOK

Sam B. Topf, Coral Gables, Fla., assignor to Jordan Industries, Inc., Miami, Fla.

Filed June 28, 1974, Ser. No. 483,951
Int. Cl.² A47G *1/20*
U.S. Cl. 248—217 **1 Claim**

1. In combination, a picture hook and a fastener for supporting said picture hook on a wall, said fastener including an elongated shank of predetermined diameter and adapted to be telescoped through said picture hook and driven into the wall to secure said picture hook on the wall, an enlarged head integrally formed with the outer end of said shank and having a substantially flat underside extending in a generally radial direction away from said shank to the periphery of said head, said picture hook including a body portion having generally flat, parallel outer and inner faces, a peripheral flange integrally formed with said body and extending inwardly therefrom a predetermined distance beyond said inner face, said flange having an inner edge formed in a plane extending generally parallel with the planes of said faces for engagement with said wall to space said inner face outwardly from said wall, a leg integrally formed with said flange and depending therefrom generally within the plane of said inner edge, said leg having a forwardly and upwardly hooked lower end portion for connection with a picture, an aperture formed through the central portion of said body and having a diameter slightly larger than the diameter of said shank, said aperture having a central axis extending generally at a forty-five degree angle with respect to the vertical, a lower lip integrally formed with said body along the lower edge of said aperture and projecting forwardly and upwardly from said outer face, said lower lip having a curved upper surface concentric with said aperture, said lower lip also having an outer end edge extending in a generally radial direction with respect to the curvature of said upper surface for abutting engagement with said underside of said head, an upper lip integrally formed with said body along the upper edge of said aperture and projecting rearwardly and downwardly from said inner face, said upper lip having a curved lower surface concentric with said aperture, said upper lip having an inner end edge spaced outwardly from said inner edge of said flange to keep from engagement with said wall, said lips cooperating to guide said shank through said aperture and into said wall at a downwardly extending angle of approximately 45°, and a generally crescent-shaped indentation formed in said body, said indentation being in said outer face and along the upper edge of said aperture, said indentation having a flat defining the bottom thereof, being formed in the plane of said outer end edge of said lower lip and extending radially away from said aperture a distance slightly greater than the distance between the periphery of said head and the outside of said shank of said fastener so the upper portion of said head fits within said indentation with a portion of said underside abutting said flat when said fastener is telescoped through said body and is driven into the wall for hanging a picture on the wall.



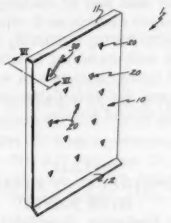
3,912,212
LABORATORY DRAINBOARD

Paul J. Betts, Sr., Muskegon, Mich., assignor to Inter Dyne, Spring Lake, Mich.

Filed July 11, 1974, Ser. No. 487,595
Int. Cl.² F16M *13/00*
U.S. Cl. 248—223 **2 Claims**

1. A drainboard, display or the like comprising: a sheet panel defining the face of said board; at least one aperture in said panel for mounting a peg, said aperture being an inverted triangle in configuration with the base of the triangle being positioned at the top thereof and the apex of the triangle being positioned at the bottom thereof; at least one removable peg including a shoulder with front and rear surfaces, an arm extending outwardly and sloping upwardly from said front of said shoulder, a neck extending outwardly from said rear of said shoulder, and a head on said neck at a point spaced from said shoulder; said head being larger in lateral cross-section than said neck whereby said head includes marginal portions extending laterally at least downwardly from said neck; said neck having a length from said shoulder to said head which is approximately equal to the thickness of said panel; said neck also defining an inverted triangle in lateral cross-section con-

figuration with the base of the triangle at the top thereof and the apex of the triangle at the bottom thereof, the triangle defined by the lateral cross-section of said neck being smaller than that defined by said aperture and having an angle at its apex which is the same as the angle of the apex of the triangle defined by said aperture such that said peg is locked into its said non-rotatable position when the apex and sides of said triangle defined by said neck cross-section are slid down into engagement with the apex and sides of said triangle defined by said aperture; said shoulder being larger in lateral cross-section than either said neck or said head; said head of said peg also defining an inverted triangle in lateral cross-section with a base at the top and an apex at the bottom, said base of the triangle defined by said head being generally flush with the



base of said triangle defined by said neck; and the sides of said triangle defined by said head being spaced from the sides of said triangle defined by said neck; said triangle defined by said head having dimensions which are equal to or just slightly less than the dimensions of said triangle defined by said aperture whereby said head can be inserted therethrough; said shoulder defining a triangle in lateral cross-section with the apex of said shoulder triangle being positioned at the top thereof and the base of said shoulder triangle being positioned at the bottom thereof, whereby liquid draining down the face of said sheet-like panel flows downwardly over the sloping sides of said shoulder triangle; said aperture being smaller than the lateral cross-section of said shoulder whereby said shoulder will not extend through said aperture.

3,912,213

FIXING CLAMP FOR SECURING FIN, TUBE OR LIKE RADIATORS OF ALL KINDS TO A WALL OR LIKE SURFACE

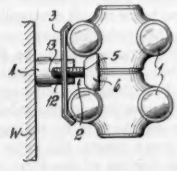
Kurt Mermi, Emmendingen; Wolfgang Schmelzle, Amoltern; Adolf Bappert, Denzlingen, and Werner Tutsch, Emmendingen, all of Germany, assignors to Upat-Max Langensiepen KG, Emmendingen, Germany

Filed May 20, 1974, Ser. No. 471,975

Claims priority, application Germany, May 19, 1973, 2325524; Apr. 13, 1974, 2418204

Int. Cl.² F24H *9/06*

U.S. Cl. 248—233 **16 Claims**



1. A fixing clamp for securing radiators having projecting portions, particularly fin- or tube-like projecting portions, to a support, comprising a clamping plate adapted to be positioned against the side of the radiator which faces the support and adapted to be secured to said support; a counter-plate having a bearing member and a plastic insert each having cooperating snap-in engaging portions to form a mechanical connection, said insert being securely mounted in said bearing member so as to form a unit adapted to assume a first fitting position in which said unit fits loosely between two adjacent projecting portions of the radiator and a second fixed position in which said unit is wedged between said adjacent portions; a fixing screw mounted on said plates and having a coupling portion; and slip-coupling means on said insert for frictionally engaging said coupling portion of said screw so that when said screw is initially turned in requisite direction, said counter-plate is moved from said first to said second position, and further turning of said screw causes said coupling portion to slip with respect to said counter-plate and moves said plates towards each other so as to clamp said adjacent portions therebetween.

3,912,214

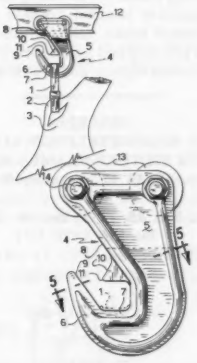
HOOK AND HOOK ASSEMBLY USING A SLING OF BAND MATERIAL

Thomas John Karass, 411 Kindersley Ave., Mount Royal, Quebec, Canada

Filed Apr. 23, 1973, Ser. No. 353,567

Int. Cl.² F16M *13/00*

U.S. Cl. 248—323 **4 Claims**



1. A hook for suspending a sling of band material therefrom comprising a suspending portion, an intermediate generally flat portion and a hooking portion joined together in a generally J-shaped configuration, said flat portion being as long as the width of said band material and interconnecting said suspending portion and said hooking portion, a protuberant lip portion attached to said suspending portion, positioned between said suspending portion and said hooking portion and forming a reduced spacing between the same which is smaller than the width of said band material, said protuberant lip portion having a lower edge which coextensively overlies said flat portion, which is lower than the uppermost point of said hooking portion, and which converges toward a point of the latter which is below the uppermost point.

3,912,215

SEAT CONSTRUCTION

Adolf Reinmoller, and Paul Werner, both of Remscheid, Germany, assignors to Keiper Fritz, Remscheid-Haten, Germany

Filed Feb. 6, 1974, Ser. No. 440,039

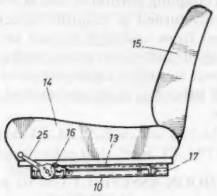
Claims priority, application Germany, Feb. 10, 1973, 2306535

Int. Cl.² F16M *13/00*

U.S. Cl. 248—421 **17 Claims**

1. In a seat, particularly in a vehicle seat, a combination comprising a support structure; a seat frame structure; a plu-

rality of elongated coupling members, at least one of which is provided with a row of teeth; pivot means, including for each of said coupling members a first pivot connecting the coupling member to said support structure and a second pivot spaced longitudinally of said coupling member from said first pivot and connecting said coupling member to said frame structure; actuating means for pivoting said coupling members about the respective pivot thereof so as to steplessly raise or lower said seat frame structure relative to said support structure between



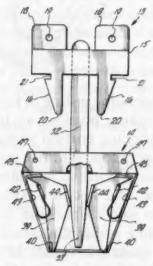
selectable positions, said actuating means comprising a spur gear continuously meshing with said row of teeth and being turnably journalled on one of said structures and an actuating member operatively connected to said gear for turning the same; and retaining means for retaining said seat frame structure in the respective selected position and comprising a springloaded friction brake, said activating means and said retaining means allowing said seat to be located at any desired position between said highest and lowest positions.

3,912,216

LOCKABLE, SELF-LEVELING WALL MOUNTING DEVICE FOR PICTURE FRAMES AND THE LIKE

Richard C. Gano, 2214 E. Sycamore St., Anaheim, Calif. 92806

Filed Feb. 25, 1975, Ser. No. 552,863
Int. Cl.² A47F 7/14
U.S. Cl. 248—475 R **6 Claims**



1. A lockable, self-leveling picture frame hanger for mounting to a wall, comprising:

a. a latching mechanism, comprising:

a male unit, comprising:

a body having a forwardly-projecting end and a rearwardly-projecting end;

a pair of spaced-apart, blade-like, latching arms depending downwardly from said rearwardly-projecting end of said body, said arms each having a notched portion therein adjacently disposed to said body; and

means for attaching said forwardly-projecting end of said body to the backside of a picture frame;

a female unit for receiving said latching arms of said male unit thereinto and effecting a key-releaseable coupling therewith, comprising:

a housing having an opening therein through which said latching arms may be inserted;

latching means within said housing, comprising:

a pair of latching members, the corresponding ends of which are pivotally mounted to said housing, whereby said latching members are disposed in side-by-side, edgewise relationship and movable towards and away from each other, said pair of latching members further having a pair of lugs at the ends opposite said pivotally mounted ends, which are correspondingly mateable with said pair of notches in said latching arms of said male unit; and

spring biasing means disposed between each of said pair of latching members and said housing, whereby said pair of latching members are urgingly biased towards each other;

b. a mounting plate having a plurality of apertures therein through which wall-anchoring fasteners may be inserted to secure said mounting plate to a wall; and

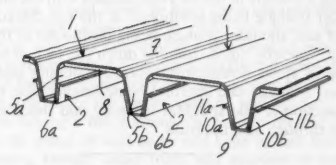
c. coupling means for swivellably interconnecting said mounting plate to said housing.

3,912,217

MEANS FOR CONSTRUCTING A FLOOR OR CEILING WITH JOISTS

Lars Ako Wilhelm Norlander, Skogsliden 9, Stocksund, Sweden

Continuation-in-part of Ser. No. 793,414, Jan. 23, 1969, abandoned. This application Mar. 30, 1973, Ser. No. 346,662
Claims priority, application Sweden, Jan. 24, 1968, 959/68
Int. Cl.² E04G 11/40
U.S. Cl. 249—31 **8 Claims**



1. A mould construction for casting concrete slab structures with depending downwardly directed beams, said mould construction comprising a plurality of transversely spaced form members of inverted U-shape each having horizontal webs and downwardly extending flanges, said form members being arranged in such a relationship that one downwardly extending flange of one form member is spaced from the adjacent flange of an adjacent form member to form the lateral sides of a mould for a depending beam of the slab, said downwardly extending flanges being resilient such that they may pivot about an axis located in the transition zone between the flange and the web of the form member under the influence of the pressure of the concrete poured into the mould between two adjacent flanges, and brace means externally supported and of U-shaped rigid profile including web portions and vertical flanges, which web portions bridge the flanges of two adjacennt form members such that the vertical flanges engage the inner surfaces of the flanges of adjacent form members so that introduction of concrete in the mould will cause said flanges of the form members to be sealingly pressed against the flanges of the brace means, the latter preventing lateral deformation of said flanges of the form members over the entire height thereof such that such flanges are constrained to remain substantially straight, said U.-shaped rigid profiles each including a number of profile pieces arranged end to end each being cut along a substantially transverse line located at a distance from the end of the respective said profile piece, said cut ending near the flange which is opposite the one in

which the cut started and continuing in a longitudinal cut extending to the free end of said respective profile piece so as to obtain a longitudinally extending projection, the cut out portions of two adjacent profile pieces being of reverse shape and cooperatively defining a rectangular opening in the web portion of the rigid profile when said profile pieces are placed in a face to face relationship, planks covering said opening and having a total width corresponding to the width of the web portion of said profile pieces and a lenngth exceeding the length of the rectangular opening, at least one prop arranged to support at least one of said planks such that said prop may support the casting when the remaining props or beams supporting the rigid profiles have been removed, thereby making it possible also to remove the form members and said rigid profiles for re-use.

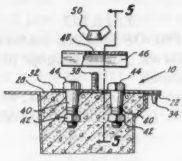
3,912,218
TEMPORARY SUPPORT DEVICE FOR A CEMENT EMBEDDED ANCHOR BOLT

Glenn F. Lister, 2221 W. Fourth, Waterloo, Iowa 50701

Division of Ser. No. 327,746, Jan. 29, 1973, Pat. No. 3,836,109. This application July 10, 1974, Ser. No. 487,280

Int. Cl.² E04G *17/00*

U.S. Cl. 249—207 **2 Claims**



1. A device for temporarily supporting an anchor bolt in wet cement while the cement hardens within the confines of an appropriate form or mold, said device comprising:

an elongated anchor bolt support member,

means on said support member for pivotal attachment to a form or mold containing freshly poured cement which has an exposed surface,

said support member being movable on its pivotal attachment to and from juxtaposition with the exposed surface of the wet cement,

anchor bolt engaging means on said support member, with an anchor bolt embedded in part in the wet cement, said support member being moved to bolt engaging position to hold said bolt immovable while the cement hardens,

an upstanding threaded shank on said support member,

a retaining cap removably mounted on said shank so as to engage said support member and embrace the exposed portion of an anchor bolt when said support member is in bolt engaging position, and

removable fastening means on said shank to releasably secure said retaining cap to said support member.

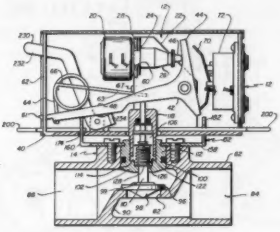
3,912,219
ZONE CONTROL VALVE ASSEMBLY

Richard Weinstein, Evanston, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 244,709, April 17, 1972, Pat. No. 3,790,122, which is a continuation-in-part of Ser. No. 80,011, Oct. 12, 1970, Pat. No. 3,711,060. This application Oct. 31, 1973, Ser. No. 411,452

Int. Cl.² F16K *31/00*

U.S. Cl. 251—128 **4 Claims**



3. A mechanism as claimed in claim 2, wherein said arms comprise deflectable inherently resilient rods.

3,912,220
BALL VALVES

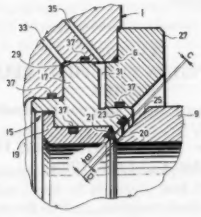
Zdenek Vasicek; Jan Kral, both of Dolni Benesov; Frantisek Stefek, Bohuslavice; Josef Halfar, Dolni Benesov, and Drahomir Rosa, Bohuslavice, all of Czechoslovakia, assignors to Moravskoslezska Armaturka, Dolni Benesov, Czechoslovakia

Filed Oct. 11, 1973, Ser. No. 405,402

Claims priority, application Czechoslovakia, Nov. 1, 1972, 7357-72

Int. Cl. F16k *5/06*

U.S. Cl. 251—159 **9 Claims**

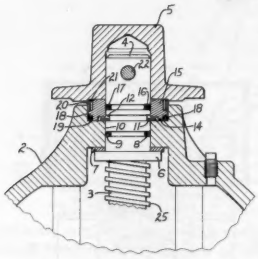


1. A valve comprising a body, an adjustable valve closing member located in said body, and seat means located in said body, said seat means having a planar functional surface lying in opposition to said valve closing member and being movably axially into cooperative relationship therewith to seal against the flow of fluid therethrough, a primary and an auxiliary sealing ring disposed independently in said seat means and spaced from each other, said primary sealing ring normally extending outwardly from the surface thereof by a first distance, said auxiliary sealing ring normally extending outwardly from the surface thereof by a second distance different from said first distance and one of said sealing rings having a greater elasticity than the other.

3,912,221
STEM SEAL AND RETAINER FOR GATE VALVE

Abraham S. Fenster, and Fred W. Salloga, both of Chattanooga, Tenn., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed June 26, 1974, Ser. No. 483,112
Int. Cl.² F16K *41/00, 31/50, 3/00*
U.S. Cl. 251—214 **4 Claims**

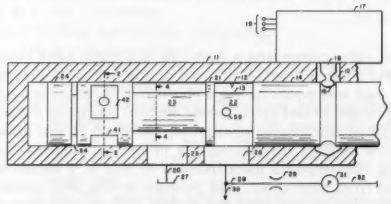


1. In combination with a non-rising stem gate valve of the type comprising a body portion with flow openings, a bonnet portion attached to said body portion in fluid-tight relationship thereto, means for opening and closing said flow openings, said means including a stem extending through a tubular opening in said bonnet, the improvement comprising a stem seal shoulder on an inner surface of said bonnet surrounding said tubular opening, a collar surrounding an intermediate portion of said stem and being of greater diameter than said tubular opening to prevent said stem from movement outwardly with respect to said bonnet, an upper shoulder on said bonnet surrounding said tubular opening exteriorly of said bonnet, means, entirely within said tubular opening, connecting said stem and said upper shoulder to prevent said stem from moving inwardly with respect to said bonnet and a slip fitting seal cartridge surrounding said stem and resting on said upper shoulder, said cartridge having an annular notch, a first "O" ring seal inserted in said notch, and being radially compressed between said seal cartridge and said bonnet portion, said stem having an annular groove therein, and a second "O" ring seal inserted in said groove and being radially compressed between said stem and said seal cartridge to prevent fluid leakage along said stem.

3,912,222
LOW FRICTION PISTON TYPE PILOT REQUIRING NO DITHER

Paul F. Hayner, Gilford, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 29, 1974, Ser. No. 465,197
Int. Cl.² F16K *39/04*
U.S. Cl. 251—282 **2 Claims**

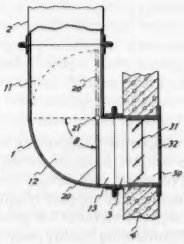


1. A valve system comprising a valve housing formed to define a hollow cylinder and a plurality of passageways providing fluid communication between said cylinder and the exterior of said housing, said passageways including a fluid pressure connection and a fluid return connection, a piston disposed within said cylinder and formed with a plurality of lands cooperating with said passageways to control the flow of fluid therebetween as said piston is displaced axially with respect to said cylinder, and means responsive to an input signal for controlling the axial position of said piston, characterized in that said system includes first and second hydrostatic bearings on opposite sides of the center of said piston, each of said bearings comprising a generally cylindrical land formed with three identical recesses on the surface thereof symmetrically located around the circumference, which recesses together with the interior surface of said cylinder define three chambers, three fluid restrictors each connected to provide restricted fluid communication between one of said chambers and said fluid pressure connection, means providing fluid communication between said fluid return connection and the interior of said cylinder at opposite ends of said generally cylindrical land, said generally cylindrical land being hollow and being formed with three generally radial passageways each providing communication between one of said recesses and the interior of said land, and a generally cylindrical plug substantially filling the hollow portion of said generally cylindrical land and formed with three radial passageways each communicating with one of said passageways in said generally cylindrical land and also formed with three longitudinal passageways each communicating with one of said radial passageways and each extending through one face thereof, each of said restrictors being a slender tube having a length many times its diameter, said tubes being in communication with and supported by said longitudinal passageways and extending beyond said face of said plug.

3,912,223
FIREPROOF SMOKE DAMPER

Yoshiaki Iwata, Fujisawa, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Mar. 15, 1974, Ser. No. 451,343
Int. Cl.² F16K *1/16;* **F23L** *13/00;* **A62C** *37/18*
U.S. Cl. 251—299 **4 Claims**

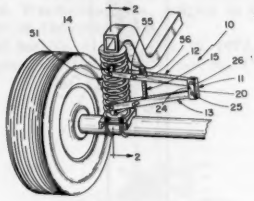


1. A fireproof smoke damper assembly comprising a duct having a substantially straight section and a curved elbow section joined one to the other, said curved section having a longitudinal section in the form of a sector of a circle having its center at one side of said duct, a shaft on said one side of said duct and substantially coincident with said center and a damper plate attached along one edge to said shaft for rotation within said duct about said center, said damper being movable from an open position lying against a wall of said straight section to closed positions when disposed at any point within said curved section and is in close proximity with the wall of said curved section.

3,912,224
SPRING COMPRESSOR

John H. Castoe, Sunland, Calif., assignor to Applied Power, Inc., Milwaukee, Wis.

Filed Aug. 8, 1974, Ser. No. 495,633
Int. Cl.² B23P *19/04*
U.S. Cl. 254—10.5 **7 Claims**



7. A spring compressor for axially compressing a coil spring comprising:

a pivot element;

a first pair of jaws pivotally mounted to said pivot element and adapted to radially span the coils of the spring;

a second pair of jaws pivotally mounted to said pivot element and adapted to radially span the coils of the spring; spring coil engaging means on each of said jaws respectively adapted to engage opposite side portions of coils of the spring in a direction axial to the spring;

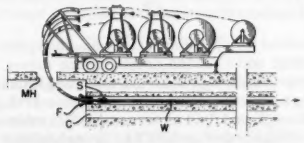
said spring coil engaging means comprising hooks pivotally attached to said first and said second pairs of jaws, said hooks having an open side to engage the coils of the spring; and

force exerting means interconnecting said first and said second pairs of jaws and adapted to urge said first pair of jaws and said second pair of jaws toward each other about said pivot element whereby when said spring coil engaging means are in engagement with coils of the spring, the portion of the spring between said engaging means of said respective pairs of jaws will be compressed.

3,912,225
GATHERING CABLE-DISPENSING VEHICLE

Merlin E. Earnheart, Bellevue, Wash., assignor to Truckweld Equipment Co., Seattle, Wash.

Filed Mar. 20, 1974, Ser. No. 452,760
Int. Cl.² B65H *75/40*
U.S. Cl. 254—134.3 R **3 Claims**



1. A cable-feeding vehicle for simultaneously dispensing multiple cables from reels travelling at different rotational speeds to a remote location at equal cable velocities, comprising:

vehicular support means,

a plurality of cable reel stands on said support means,

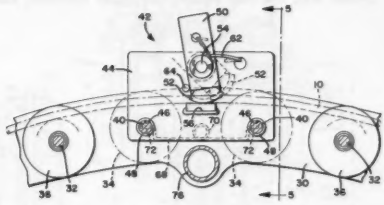
powered means for rotating said cable reels at independently variable speeds for pushing the cables off the reels at substantially equal lineal velocities and tensions, and

quide means for guiding the cables from said reels to a common remote location, said guide means including segregating means for separating the individual cables until they reach said remote location to reduce abrasion damage and stationary gathering means for bringing the cables together in a compact bundle at said remote location, said stationary gathering means including a plurality of vertically separated chutes, each chute having a wide entrance for receiving a cable and a narrow discharge, said narrow discharges all terminating in a common channel at said remote location.

3,912,226
CORNER STRAND BRAKE ASSEMBLY

Richard L. Jackson, Lewisburg, Ohio, assignor to Jackson Communication Corporation, Clayton, Ohio

Filed July 26, 1974, Ser. No. 492,059
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 PA **10 Claims**



1. A corner strand brake assembly comprising:

a. a supporting framework,

b. a plurality of axles mounted in said framework in spaced parallel relationship to each other,

c. a plurality of strand sheaves mounted on said axles with strand engaging surfaces of said sheaves lying in substantially the same plane,

d. said spaced parallel axles of said sheaves extending substantially perpendicularly to an arc of a circle positioning said strand engaging surfaces of said strand sheaves to define an arcuate strand path,

e. a base member mounted on said supporting framework intermediate a pair of strand sheaves,

f. a backing member having a strand engaging surface mounted on said base member and disposed along said arcuate strand path,

g. brake means mounted on said base member and having a strand engaging surface, and

h. means mounting said brake means for movement of said strand engaging surface thereof toward and away from said strand engaging surface of said backing member for braking a strand therebetween upon movement of the strand in one direction.

3,912,227
MOTION COMPENSATION AND/OR WEIGHT CONTROL SYSTEM

Joseph Fitzpatrick Meeker, Seabrook; Michael Donahoo Keen; Larry E. Lee, both of Houston, and Roderick Charles LeJeune, Alvin, all of Tex., assignors to Drilling Systems International, Inc., Houston, Tex.

Filed Oct. 17, 1973, Ser. No. 407,051
Int. Cl.² B66D *1/50*
U.S. Cl. 254—172 **38 Claims**

1. in a load-supporting assembly for supporting a load which is movable relative to the load-supporting assembly, an improved motion compensation and/or weight control system, comprising:

an outer cylinder having end plates at either end thereof;

an inner cylinder disposed concentrically within the outer cylinder and depending from the first end plate;

a cylindrical piston rod slidably disposed around the inner cylinder and extending through the second end plate of the outer cylinder for longitudinal movement relative thereto;

one of the outer cylinder or the piston rod being mounted for movement with the load-supporting assembly and the other of the outer cylinder or the piston rod being mounted for movement with the load;

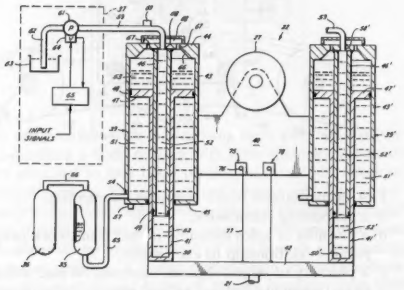
a first piston secured to the piston rod within the annular chamber between the inner cylinder and the outer cylinder and slidably sealed against the outer cylinder;

means for slidably sealing the piston rod against the inner cylinder;

means for slidably sealing the piston rod against the second end plate of the outer cylinder;

a second piston secured to and sealing the end of the piston rod opposite the end of the piston rod to which the first piston is secured;

the variable volume annular chamber formed between the piston rod, the first piston, the outer cylinder, and the



second end plate of the outer cylinder, being the primary chamber;

the variable volume chamber formed within the first end plate of the outer cylinder, the inner cylinder, the piston rod, and the second piston, being the secondary chamber;

means in fluid communication with the primary chamber for passively supplying fluid under pressure to the primary chamber whereby force is supplied against the first piston tending to move the piston rod in the direction to support the load; and

means in fluid communication with the secondary chamber for actively supplying fluid into and allowing the withdrawal of fluid out of the secondary chamber whereby a biasing force may be supplied against the second piston tending to move the piston rod in the direction opposing the support of the load.

3,912,228

INTEGRATED CHAIN-WIRE ROPE MOORING SYSTEM

Terry Petty, New Orleans; Carmon R. Costello, Kenner; John L. Bell, Metairie; Mark A. Childers, and Gude P. Rao, both of New Orleans, all of La., assignors to Ocean Drilling & Exploration Company, New Orleans, La.

Filed May 31, 1974, Ser. No. 475,012

Int. Cl.² B66D 1/72

U.S. Cl. 254—175.7 **4 Claims**

4. An integrated mooring system for mooring a structure floating on a body of water, said system comprising:

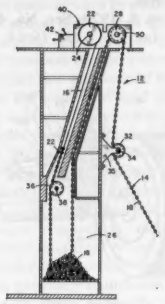
a mooring line consisting of: a wireline, a chain, and a connector coupling the wireline to the chain;

a drum rotatably mounted on said structure, a chain locker in said structure for housing said chain;

a wildcat mounted on said structure for paying-in and paying-out said mooring line; and

power means adapted for selectively powering said drum and said wildcat simultaneously or sequentially,

said power means being operable to stop said drum after winding said wireline thereon and continue rotation of



said wildcat to effect storage of said chain in said chain locker during a pay-in of said mooring line.

3,912,229

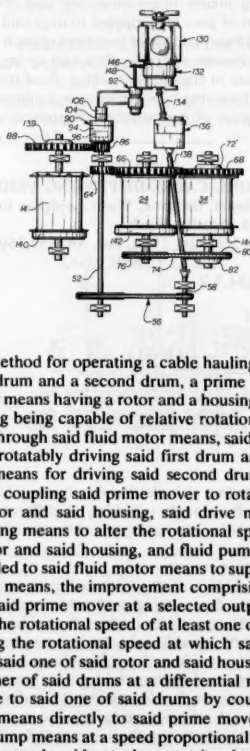
CABLE HAULING SYSTEM WITH HYDRAULIC DIFFERENTIAL

Michael D. Mitchell, Bellevue, Wash., assignor to Formac International, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 314,841, Dec. 13, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,668

Int. Cl.² B66D 1/26

U.S. Cl. 254—185 AB **7 Claims**



4. In a method for operating a cable hauling system including a first drum and a second drum, a prime mover, a rotary fluid motor means having a rotor and a housing, said rotor and said housing being capable of relative rotation in response to fluid flow through said fluid motor means, said rotor including means for rotatably driving said first drum and said housing including means for driving said second drum, drive means operatively coupling said prime mover to rotatably drive one of said rotor and said housing, said drive means including speed varying means to alter the rotational speed of said one of said rotor and said housing, and fluid pump means operatively coupled to said fluid motor means to supply fluid to said fluid motor means, the improvement comprising the steps of:

operating said prime mover at a selected output speed,

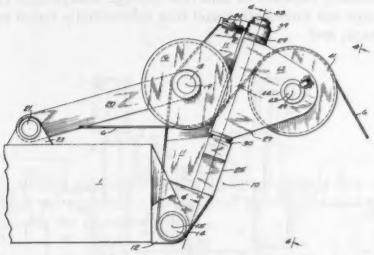
altering the rotational speed of at least one of said drums by altering the rotational speed at which said drive means drives said one of said rotor and said housing, and driving the other of said drums at a differential rotational speed relative to said one of said drums by coupling said fluid pump means directly to said prime mover to drive said fluid pump means at a speed proportional to said selected output speed, said speed proportional to said selected

output speed being independent of the rotational speed of said one of said drums thereby rendering said differential rotational speed independent of the rotational speed of said one of said drums.

3,912,230
DRAGROPE FAIRLEAD ASSEMBLY

Tom Learmont, Wauwatosa, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Continuation of Ser. No. 411,037, Oct. 30, 1973, abandoned. This application May 20, 1974, Ser. No. 471,246
Int. Cl. B66d *1/36*
U.S. Cl. 254—190 R **12 Claims**



7. In an excavating machine having a boom which supports a bucket on the end of a hoist rope and which is connected to extend forward from a main frame, and having a dragrope which runs from the bucket to a power driven drum mounted on the main frame, a fairlead assembly for guiding the dragrope in its run between the bucket and the power driven drum, the combination comprising:

a support member attached to the forward edge of said main frame;

an inboard sheave rotatably mounted to said support member for rotation about a first horizontal axis of rotation;

a sheave block mounted to said support member for swinging motion about a forwardly inclined block pivot axis which is forward of and in the plane of said inboard sheave; and

an outboard sheave rotatably mounted to said sheave block for rotation about a second horizontal axis of rotation;

wherein said dragrope runs from said power driven drum beneath said inboard sheave to wrap around a lower rope engaging surface on said inboard sheave, and extends upward and over said outboard sheave to wrap around an upper rope engaging surface on said outboard sheave.

3,912,231
APPARATUS FOR TREATING AND MIXING PARTICLES

Joseph A. Weber, Minneapolis, Minn., assignor to Gustafson, Inc., Hopkins, Minn.

Filed Jan. 17, 1974, Ser. No. 434,033
Int. Cl.² B01F *15/02*; **B05C** *11/04*
U.S. Cl. 259—2 **14 Claims**

9. A treating and mixing apparatus for applying a liquid to particles and mixing the latter, comprising:

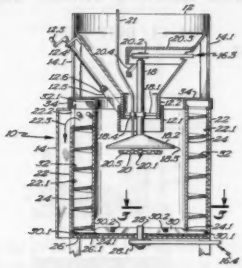
a. means for treating particles with a liquid including a distributing cone having a vertical axis and an upwardly convergent upper surface, a chute for dispensing particles onto the upper surface of the cone, the particles falling in a curtain from the periphery of the cone, and a motor-driven disc rotatably mounted coaxially below the cone, the disc being adapted to rotate rapidly about its axis and to hurl liquid in small droplets outwardly into contact with the falling curtain of particles;

b. a stationary floor, and an outer, upright, cylindrical wall arising from the floor and having an outward opening adjacent its upper end;

c. a motor-driven, upright shaft extending upwardly through the floor and coaxial with the axis of the cone;

d. a paddle mounted to the shaft and adapted to rotate therewith to sweep fallen treated particles outwardly toward the outer wall;

e. an inner wall spaced concentrically within the outer wall and mounted to the paddles for rotation about the axis of the cone, the inner wall having a bottom edge spaced from the floor, and the floor and inner wall at least partially defining a treatment chamber within which is housed the cone and disc;



9f. a helical ribbon positioned between the inner and outer walls and mounted to the inner wall for rotation therewith about the axis of the cone, the ribbon having a bottom end for receiving outwardly swept particles from the floor and conveying the particles upwardly with concurrent mixing, the ribbon terminating at its upper end in a plate so oriented as to deflect the particles laterally outwardly through the opening in the outer wall.

3,912,232
BLENDING SILO

Bruno A. Gmuer, St. Gallen, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Feb. 6, 1974, Ser. No. 440,278
Claims priority, application Sweden, Feb. 7, 1973, 731729
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **8 Claims**

1. A blending silo comprising:

a. container structure including vertical radially inner and outer generally cylindrical walls defining an inner material receiving area and an outer annular material storage and removal area surrounding the receiving area;

b. said inner wall having edge means extending helically of the container and comprising an edge extending continuously for substantially a full circumference of the container and over which material flows from said inner area to said outer area;

c. collector means underlying said container structure;

d. and connecting conduit means between said container structure and said collector means for delivery of material

from said storage and removal area to said collector means.

3,912,233

APPARATUS FOR CONTINUOUS TREATMENT AND PROCESSING OF SOLID AND/OR LIQUID MATERIALS

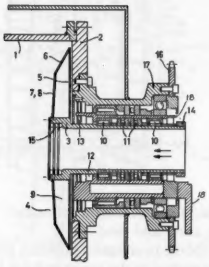
Guenter Stoeckelmann, Frankenthal-Moersch, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 10, 1973, Ser. No. 378,007

Claims priority, application Germany, July 10, 1972, 2233815

Int. Cl.² B01F *15/00*

U.S. Cl. 259—3 3 Claims



1. An apparatus for the continuous treatment and processing of solid or liquid products which change physical state during treatment,, said apparatus comprising:

a rotatable processing chamber, said chamber having a substantially right cylindrical shape with an arcuate side wall and two substantially flat end walls, the first of said end walls having means through which said product is charged into said chamber, the second of said end walls having means through which said product is discharged from said chamber; grinding elements within said processing chamber;

and a scraper element arranged for rotating movement about an axis parallel to and eccentric with the longitudinal axis of said processing chamber, said scraper element being mounted freely rotatable about said parallel axis near the first of said chamber end walls; whereby said scraper is entrained to rotate by friction occuring between said scraper and said chamber first end wall and the product adhering thereto, and friction between the surface of said scraper and the product and the fillet region formed by said arcuate wall and the first of said end walls is kept free of product deposits through a differential in the speed of rotation of said scraper and said processing chamber.

3,912,234

APPARATUS FOR MIXING AND INJECTING LIQUIDS INTO A MOLD

John William Peter, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Aug. 29, 1974, Ser. No. 501,668

Int. Cl.² B01F *5/06*

U.S. Cl. 259—4 19 Claims

1. An apparatus for mixing liquids received from separate sources which comprises in combination:

a. a housing assembly with a generally centrally located bore extending therethrough;

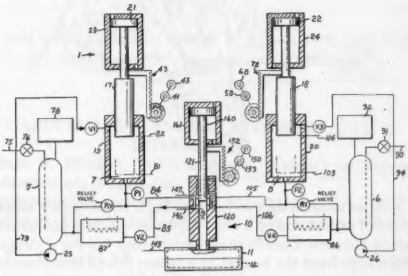
b. a plunger fitted into and axially slidable withinin said bore;

c. said housing assembly further comprising the following elements arranged axially along the bore with the bore passing through each element:

i. a mixing plate having a plurality of axially extending slots located around the bore circumference, a chamber radially outward of each slot, and a first series of holes located on a first radius from the bore axis at least partially through said plate;

ii. first substantially radial passage means in one of said elements connecting a first group of selected ones of said chambers with said first holes;

iii. a clamping ring with a generally central opening larger than said bore and with first and second substantially radially extending passages therethrough which respectively terminate and connect to a first passage formed peripherally around said central opening at that end of the ring closest to said mixing plate and to a second passage formed as a groove in the same end of the ring radially outward of said first passage said second passage not intersecting said first substantially radial passage; and



iv. a flanged sleeve having a tubular body through which extends said bore, said body being fitted in liquid tight relation within said clamping ring central opening, and with a radially extending flange at one end of said body in face-to-face engagement between the aforesaid end of the clamping ring and one side of said mixing plate, said flange having a second series of holes each connecting said first passage to said selected chambers in the mixing plate and a third series of holes connecting said clamping ring second passage to said mixing plate first series of holes; and

v. means holding said elements together; and

vi. motor means to move said plunger one direction in said bore by a predetermined stroke sufficiently large to completely mask said slots and to retract said plunger by a stroke large enough to expose a preselected axial portion of said slots.

3,912,235

MULTIBLEND POWDER MIXING APPARATUS

Kenneth T. Janssen, Broadbrook, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,339

Int. Cl.² B01F *15/02*

U.S. Cl. 259—4 8 Claims

1. Multiblend powder mixing apparatus which comprises:

a plurality of powder feeders each including means for storing powders, a gas inlet, and an outlet for discharging gas and entrained powders therefrom;

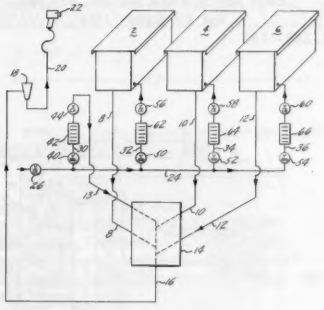
means for connecting the individual powder feeder gas inlets to a source of pressurized gas;

regulating means for controlling the gas flow through each connecting means;

a powder mixing manifold having a mixing chamber therein, a plurality of inlets to the mixing chamber, and an outlet from the mixing chamber;

entrained powder transmission means interconnecting, for each powder feeder, a powder feeder outlet and a mixing manifold inlet;

gun supply means for connecting the outlet of the mixing manifold to powder spraying apparatus; and



independent gas means for providing a regulated flow of gas from the gas source through the gun supply means, bypassing the powder feeders.

3,912,236

EMULSIFYING AND DISPERSING APPARATUS WITH CONCENTRIC RINGS OF TOOLS

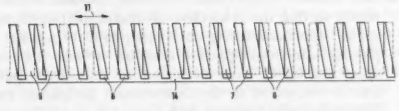
Manfred Zipperer, and Reinhard Prochnau, both of Staufen, Germany, assignors to Internationale Laboratoriums-Apparate GmbH, Ballrechten-Dottingen, Germany

Filed Feb. 28, 1974, Ser. No. 447,049

Claims priority, application Germany, Mar. 1, 1973, 2310321

Int. Cl.² B01F *7/26*

U.S. Cl. 259—24 **9 Claims**



1. An emulsifying and dispersing apparatus for the treatment of a medium, comprising at least one working stage formed of at least two relatively rotatable tool rings having concentric axes, such as a rotor and a stator, including first and second tool rings, formed by respective first and second toothed elements in respective planes, separated by first and second, substantially parallel groove spaces, said rings being arranged about a suction chamber that serves as a central supply chamber, wherein substantially parallel portions of adjacent ones of said toothed elements, which bound said groove spaces in the peripheral direction of at least one of said tool rings and cooperate in one of said working stages, are inclined in the axial direction at an acute angle relative to the respective planes of said toothed elements of the other one of said tool rings, thereby constituting a high proportion of overlapping between said first and said second groove spaces during the rotation of at least one of said tool rings, wherein said adjacent toothed elements constitute cooperating impacting and shearing flanks between said tool rings, and said groove spaces in the outer one of said tool rings constitute discharge openings about the entire periphery of the apparatus.

3,912,237

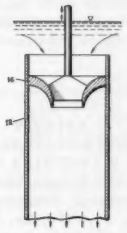
METHOD AND APPARATUS FOR MOVING OF LIQUID PHASES IN INDUSTRIAL PROCESSES

Jan-Erik Ostberg, Bettna, and Sven Anders Noren, Bromma, both of Sweden, assignors to Jan-Erik Ostberg, Bettna, Sweden

Filed June 26, 1969, Ser. No. 836,918

Int. Cl.² B01F *13/00*

U.S. Cl. 259—112 **6 Claims**



4. Apparatus for producing a substantially rectilinear and unidirectional flow within a body of liquid in container, comprising a liquid propelling member immersed in said body of liquid and disposed at a distance from the walls of said container and means for substantially rectilinearly reciprocating said liquid propelling member in coincident paths in both directions within said body of liquid, the liquid propelling member having a concave face with walls substantially parallel to the direction of reciprocation at their free edges facing in one direction of movement and a non-concave face facing in the other direction of movement whereby movement of said member in said one direction produces a substantially larger resistance to said movement, and thereby exerts a substantially larger force on the liquid in said body of liquid, than upon the movement thereof in the opposite direction and that upon the movement in said opposite direction the liquid flowing in said one direction with respect to said liquid propelling member adjacent the periphery thereof moves inwardly into the concavity of the concave faces in which said liquid propelling member has a central opening therein and has a half-concave face directed in said one direction and a half-convex face directed in said opposite direction.

3,912,238

PROCESS AND INSTALLATION FOR THE DISTRIBUTION, INTO A MOLD, BY HIGH SPEED PROJECTION, OF A GRANULAR AND/OR PULVERULENT MIXTURE

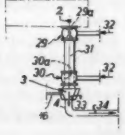
Gerard Yves Richard, 30, rue du Havre, 60 Precy-sur-Oise, France

Filed May 29, 1973, Ser. No. 364,613

Claims priority, application France, May 29, 1972, 72.19176

Int. Cl.² B28C *5/06, 5/14*

U.S. Cl. 259—151 **10 Claims**



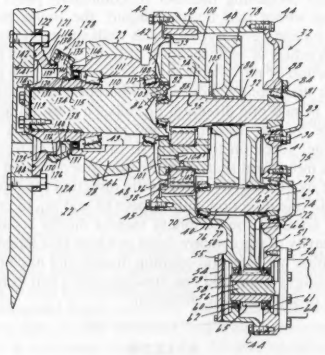
1. Distribution apparatus for high speed projection of a granular and/or pulverulent mixture comprising a mixing

device for the formation of the mixture, and means for picking up said mixture at the exit of the mixing device and for its distribution as far as its point of utilization, said last named means comprising a pneumatic accelerator which communicates on one side with the exit of the mixing device and on the other side with the point of utilization of the mixture, first means for displacing the mixture from the exit of the mixing device to the intake of said pneumatic accelerator which at least in the zone terminating with the intake into the accelerator is vertical from top to bottom, and second means comprising a vertically disposed zone for taking the mixture from the interior of the accelerator while the mixture is still in movement from the first means and pneumatically forcing it from approximately the exit of the pneumatic accelerator to its point of utilization.

3,912,239
APPARATUS FOR ROTATABLY DRIVING AND SUPPLYING WATER TO A MIXING DRUM

Donald L. Ries, Dearborn Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1974, Ser. No. 534,460
Int. Cl.² B28C *5/42, 7/14*
U.S. Cl. 259—168 **18 Claims**



13. A coupling assembly for rotatably driving an end wall of a mixing drum and supplying water to passages provided through the end wall comprising

a driving member including a flange having a drum end wall abutting surface on one axial side of said member and a hub extending axially outward from the other said of said member,

means for drivingly connecting said flange to said end wall, means for drivingly connecting said hub to a power output to rotate said member,

an annulus slidably received on and circumferentially enclosing an axial length of said hub and having at least one interior surface spaced from a facing surface of said hub to form a water chamber therebetween,

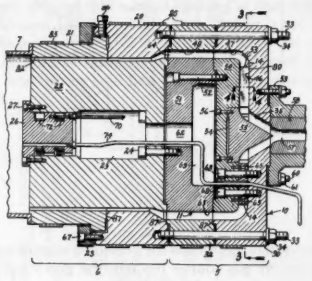
water inlet means through said annulus for supplying water to said chamber, and

water passage means through said driving member and providing fluid communication between said water chamber and said one side of said driving member.

3,912,240
METHOD AND APPARATUS FOR EXTRUDING PLASTIC PIPE AND THE LIKE

Roger Dallas Smith, Bethel, and Herbert Karl Maar, Cincinnati, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed July 9, 1973, Ser. No. 377,764
Int. Cl. B29d *23/04*
U.S. Cl. 259—185 **6 Claims**



1. A die head to which a die set is to be attached to form a unit for the extrusion of plastic pipe and comprising:

a. a housing assembly having a recess, at the bottom of which recess is a substantially flat radial inlet surface having therein an opening that is a feed channel for the entrance of plastic material and an annulus surface connected substantially perpendicular to said inlet surface to form recess walls;

b. a die head mandrel support assembly within said recess having as its major outside surfaces a flat radial inlet surface on one end, a radial die set mounting surface on the opposite end, and an annulus surface connecting them;

c. said mandrel support assembly being disposed within said recess so that the respective aforesaid inlet surfaces are spaced apart and facing each other to form a radial inlet passage and the respective annulus surfaces are spaced apart and facing each other to form an annular passage that is connected to the downstream peripheral end of said radial inlet passage; and

d. a plurality of torpedoes each having substantially flat mounting surfaces engaging said respective inlet surfaces radially disposed between and spacing apart said respective inlet surfaces; whereby plastic material entering through said inlet surface opening flows in a direction substantially parallel to the flow in said annular passage and substantially perpendicular to the flow in said radial inlet passage.

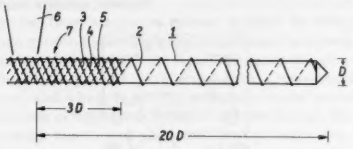
3,912,241
PRESS EXTRUDER FOR PROCESSING THERMOPLASTIC MATERIALS

Ulrich Oestreich, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 5, 1974, Ser. No. 503,437
Claims priority, application Germany, Sept. 10, 1973, 2346032
Int. Cl.² B29B *1/10*
U.S. Cl. 259—191 **5 Claims**

1. An improved screw for a single-screw press having a slotted cooled cylinder in the feed section for processing

thermo-plastic materials in powder or granular form, comprising a screw having at least three flights in the feed section with



the number of flights approximately proportional to the screw diameter divided by the constant 25.

3,912,242

FLAME CUTTING MACHINE

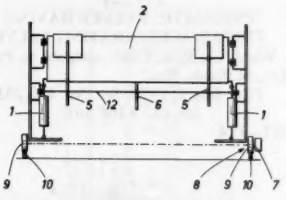
Rudolf Schoffmann, Preglstrasse 8, Linz, Austria

Filed June 11, 1973, Ser. No. 369,067

Claims priority, application Austria, June 20, 1972, 5285/72

Int. Cl.² B23K *7/10*

U.S. Cl. 266—23 K **3 Claims**



1. In a flame cutting machine for transversely severing elongated stock advancing in a longitudinal direction in a predetermined path, comprising running gear means movable along the predetermined path, drive means operable to move the running gear means along the path, a vertically reciprocable torch-guiding beam extending across the path and carried by the running gear means for movement in unison therewith along the path, torch means carried by, and transversely movable along, the beam to perform a transverse cut through the stock upon vertical downward reciprocation of the beam, and control means for controlling the drive means so as to move the running gear means in the longitudinal direction of the advancement of the stock and in synchronism therewith, the control means comprising a feeler means carried by the beam for free movement in the longitudinal direction and engaging the top of the stock upon downward reciprocation of the beam to synchronize the movements of the running gears with the advancement of the stock, the improvement of the feeler means being mounted on the beam for free movement in a direction transverse to the longitudinal direction, and a positive parallel motion guide supporting the beam and feeler means for common vertical motion parallel to the elongated stock when the feeler means engages the top of the stock.

3,912,243

APPARATUS AND PROCESS FOR REFINING HOT METAL TO STEEL

Yi-Chung Chang, Murrysville, Pa., assignor to Berry Metal Company, Harmony, Pa.

Filed Apr. 4, 1973, Ser. No. 347,743

Int. Cl.² C21C *5/46*

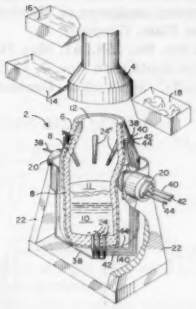
U.S. Cl. 266—34 LM **3 Claims**

1. A bottom-blow converter for making steel comprising a bottom lance projecting upward into the bottom of the converter for injection of oxygen into the bottom of the converter and into the molten bath having iron to refine the bath to steel, and

a top burner-lance comprising a curved lance structure including a reciprocal vertically extending element,

gear means cooperative with said vertically extending element for reciprocating same,

a diagonal arm pivotally connected to said reciprocal element,



an arcuate curved lance bearing oxygen passages being connected to the top of the diagonal arm for introducing oxygen to combine with the combustible gases formed in the top of the converter during the steel making process to introduce sufficient heat of combustion to adequately melt the bath to steel, and

hoist means connected to said curved lance for raising and lowering same attendant to raising and lowering of the reciprocal element by the gear means.

3,912,244

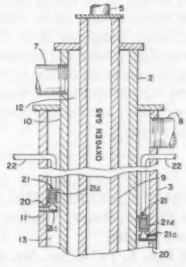
APPARATUS FOR OXYGEN-LANCING A METALLURGICAL BATH

Yi-Chung Chang, Murrysville, Pa., assignor to Berry Metal Company, Harmony, Pa.

Filed Nov. 11, 1974, Ser. No. 522,545

Int. Cl.² C21C *7/00*

U.S. Cl. 266—34 L **2 Claims**



1. For a basic oxygen steel making converter,

an overhead lance having a water-cooling structure in the form of a water spray around the barrel of the lance,

said lance including a water cooling jacket,

the spray structure including exit water spray nozzles in the wall of the lance barrel for emitting water spray from the water cooling jacket within the lance to prevent skull formation thereat and conditioning the water gases generated in the converter to facilitate dust removal, and

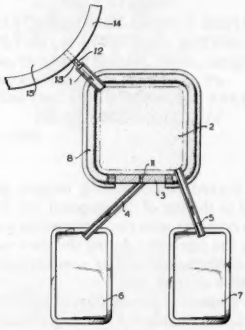
said water spray structure including an air motor means having a bellows acting upon a source of air pressure and a valve operated by said bellows for selectively allowing

water from said water jacket into said spray nozzle and out around the barrel of the lance.

3,912,245
APPARATUS FOR SEPARATING PHOSPHORUS FURNACE SLAG AND FERROPHOSPHORUS FROM ONE ANOTHER

Ursus Thümmler, and Josef Rothkamp, both of Erftstadt-Liblar, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 258,261, May 31, 1972, Pat. No. 3,802,561. This application Nov. 7, 1973, Ser. No. 413,518
Claims priority, application Germany, June 2, 1971, 2127251
Int. Cl.² C21B 7/14
U.S. Cl. 266—37 **1 Claim**



1. In an apparatus for separating a mixture of phosphorus furnace slag and ferrophosphorus into its components, wherein a phosphorus furnace vessel and a separating bed communicate with one another through a tapping hole disposed in the wall of the phosphorus furnace vessel so as to open into a conduit which in turn opens into a pouring spout terminating in the separating bed and wherein a solidification bed receiving the phosphorus furnace slag is connected to the separating bed by means of an overflow, and wherein a solidification bed receiving the ferrophosphorus is connected to the separating bed by means of an outlet spout, and wherein said separating bed is fitted at one of its sides with a refractory plate having a closable bunghole in its lower part, and said outlet spout is extending from directly downstream of the said bunghole, the improvement according to which said solidification beds receiving the phosphorus furnace slag and the ferrophosphorus, respectively, are beds prepared from granulated phosphorus furnace slag.

3,912,246
AUTOMATIC STABILIZING SYSTEM

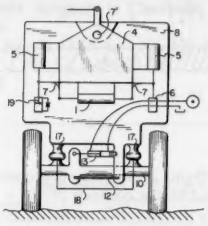
Jonses Karl Erik Olsson, Braas, Sweden, assignor to Lihnell Vagn AB, Braas, Sweden

Filed Feb. 5, 1974, Ser. No. 439,838
Claims priority, application Sweden, Feb. 5, 1973, 7301538
Int. Cl.² B60G 21/06
U.S. Cl. 267—11 R **10 Claims**

1. A stabilizing system for land and water vehicles and preferably intended for use as a stabilizer in vehicles, said system comprising:

a transmitter device means connectable to a first portion of a vehicle for sensing acceleration thereof due to inclination, centrifugal forces or retardation on braking;

control means, and stabilization effecting and power transmitting means, connectable between said first portion and a second portion of a vehicle, responsive to said transmitter device means for countering said acceleration and for stabilizing the position of said first portion with respect to said second portion about an axis of said vehicle; and

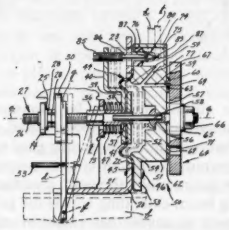


said transmitter device means comprising at least two masses, said masses being interconnected and movable, against the force of spring action, in at least one parallel plane oriented substantially at right angles to said axis about which stabilization is to be effected.

3,912,247
PNEUMATIC RETARD HAVING STROKE-ACCELERATING VALVE

David M. Ward, La Jolla, Calif., assignor to Potter Electric Signal Co., St. Louis, Mo.

Filed Jan. 2, 1974, Ser. No. 430,203
Int. Cl.² F16F 5/00
U.S. Cl. 267—114 **6 Claims**



1. A device-actuating pneumatic retard comprising

a mounting bracket,

a rigid chamber member supported thereby and having a principal chamber portion and means to provide for the retarded passage of air therefrom,

a flexible membrane extending sealedly across said principal chamber portion whereby one of its surfaces comprises an inner surface of a variable-size pneumatic chamber and its opposite surface is subject to atmospheric pressure,

a device-operating plunger supported reciprocally on the mounting bracket and having one end connected to the mid-portion of the membrane, whereby plunger movement away from the chamber member enlarges such pneumatic chamber to maximum volume, and

spring means to urge the plunger toward the principal chamber portion to a reduced volume position and thence to a minimum volume position,

characterized in that

the chamber member has a constant volume secondary chamber portion and air bypass passage means communicating the presure of the principal chamber portion to the secondary chamber portion, the secondary chamber portion having a bypass valve communicating to the external atmosphere and closed by excess of internal pressure over atmospheric pressure, and in having

means to open said valve responsive to spring-urged movement of the actuating plunger over that portion of the plunger stroke from reduced volume position to minimum volume position,

whereby, from maximum volume position to reduced volume position, movement of the plunger is slowed by the escape of air through the retard means to the atmosphere, thereby to provide the plunger with a retard stroke portion, and whereby, at the reduced volume position, the opening of said valve bypasses the air through the bypass passage means and valve and thus provides the plunger with an accelerated stroke portion to the minimum volume position.

3,912,248

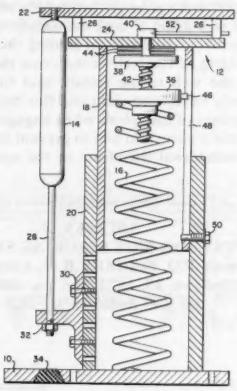
SLAM/SHOCK ISOLATION PEDESTAL

Edward V. Pickford, Potomac; Richard M. Mahone, Rockville, and Herbert L. Wolk, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1974, Ser. No. 454,886

Int. Cl.² F16F *13/00*

U.S. Cl. 267—131 **6 Claims**



1. An acceleration absorbing mount, comprising:

a base and an object supporting platform joined to said base by first means for absorbing accelerations plus second means for absorbing accelerations, said second means acting in parallel with said first means and being connected to said mount by a lost motion connection to render said second acceleration absorbing means inoperative over the first portion of travel of said object supporting platform, both of said acceleration absorbing means automatically recycling to their initial position between accelerations.

3,912,249

CAKE FROSTING DEVICE

Humberto Vaca, 11874 College, Detroit, Mich. 48205

Filed Jan. 6, 1975, Ser. No. 538,570

Int. Cl.² B25B *11/00*

U.S. Cl. 269—54.5 **19 Claims**

1. A cake frosting device which comprises,

a plate having an upper face adapted to support a cake layer and having an under side,

a pedestal adapted to rest on a supporting surface and to support said plate in a position elevated above said surface,

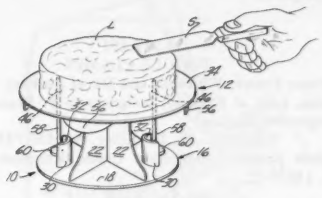
said plate having a plurality of apertured portions, each of which opens at said upper face and said under side,

a plurality of pins each having end portions and each being dimensioned to slide generally vertically through said apertured portions,

said under side being provided with means forming a guide associated with each apertured portion,

each guide having surface portions positioned for engagement by a said pin moved generally horizontally beneath said plate in alignment therewith,

said surface portions of each guide extending toward a said apertured portion and being effective responsive to engagement therewith of a pin so moving to guide said pin to a said apertured portion,



support means positioned generally vertically below each apertured portion,

a said pin in a generally vertical orientation beneath a said apertured portion being detachably engageable in vertically supported relation with said support means,

each pin having such a length that when it is so engaged with said support means, an upper portion of said pin at least partially enters said apertured portion.

3,912,250

JIG FOR SETTING WORKPIECES

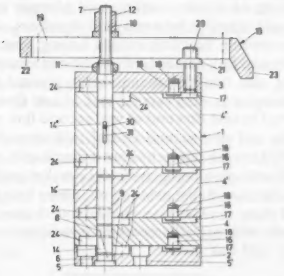
Heinz Kisslig, Felben, Switzerland, assignor to Utilis Mullheim AG, Mullheim, Switzerland

Filed Feb. 5, 1974, Ser. No. 439,930

Claims priority, application Switzerland, Feb. 8, 1973, 1785/73

Int. Cl.² B23Q *3/06*

U.S. Cl. 269—91 **11 Claims**



1. A jig for setting a workpiece on a platen, comprising:

a plurality of stack elements each including an opening extending therethrough located in alignment with the corresponding openings in the other stack elements upon arrangement of said elements in a stack;

a tension rod extending axially through said openings in said stack elements and including a lower end disposed to be attached to the lowermost of said stack elements and an upper end extending above said stack of elements;

said tension rod comprising a plurality of rod segments, each of them being connected to a corresponding stack element providing a predetermined axial play, each rod segment further being provided with connecting means

for joining said rod segments in an end-to-end relationship, said rod segments together with said corresponding stack elements being laterally slidable relative to each other to engage and disengage said connecting means in the assembly and disassembly of said rod segments;

locking means for locking each adjacent pair of stack elements together to prevent relative rotation between said pair of stack elements about said tension rod; and

a clamping element mounted on said upper end of said tension rod for engaging and holding a workpiece against the platen.

3,912,251

TOGGLE CLAMPS

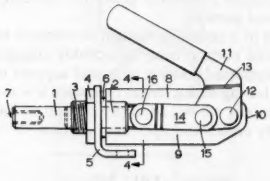
Ian Bruce Fraser, Whitwell, and David Anthony Whitbread, Luton, both of England, assignors to F. Brauer Limited, Harpenden, England

Filed Mar. 28, 1974, Ser. No. 455,745

Claims priority, application United Kingdom, Mar. 28, 1973, 14899/73

Int. Cl.² B25B *1/14*

U.S. Cl. 269—228 **11 Claims**



1. A toggle clamp comprising an apertured guide having front and rear ends and a first axis therethrough, a plunger slidable in said guide along said axis, first and second elongated supporting members, said members extending in spaced relation rearwardly from the rear end of said guide parallel to said axis and symmetrically on opposite sides thereof to lie in a plane containing said axis, a web joining said members at the ends thereof remote from said guide, said web and said members defining a rearwardly extending slot-like opening co-axial with said guide, the transverse dimension of said slot-like opening being of a size enabling said plunger to be moved axially in said opening between said members, and a toggle linkage comprising first link means having first and second ends and second link means having first and second ends, said first end of said first link means being pivoted to said web about a second axis, said second end of said first link means being pivoted to said first end of said second link means about a third axis, and said second end of said second link means being pivoted to said plunger about a fourth axis, said second, third and fourth axes being mutually parallel and being each perpendicular to said first axis and moreover being perpendicular to said plane, and said second and fourth axes intersecting said first axis, and manually operable handle means associated with one of said link means.

3,912,252

FOLDING APPARATUS

Frank Douglas Stephens, Arcanum, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

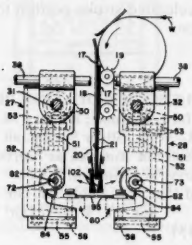
Filed Sept. 26, 1973, Ser. No. 401,039

Int. Cl.² B65H *45/20*

U.S. Cl. 270—79 **9 Claims**

1. In apparatus for zig-zag folding a web of paper along lines of cross perforation between the web edges to produce a stack of partially connected folds, such as a series of business forms, and including means for feeding the web at a predetermined speed, spaced apart sets of folding spirals, the spirals having leading edges and being rotatably driven for folding the web on the lines of cross perforation, and an oscillatory guide member driven in timed relationship with the sets of spirals and the wel- feeding means for distributing the web back and forth between the folding spirals, the improvement comprising:

flexible resilient folder arms fixed relative to the spirals adjacent the leading edges thereof and projecting in a generally radial direction substantially beyond the periphery of the spirals to move simultaneously therewith to



engage the web resiliently behind the cross perforations near the web edges to pull the web from the oscillatory guide member for continous feeding thereof and to promote folding of the web at the cross perforations while guiding the web to the spirals, said folder arms being sufficiently flexible to yield and flex backwardly toward the periphery of the spirals when engaging the web folds, to promote a clean fold and to prevent tearing of the web during withdrawal therefrom as the spirals continue to rotate.

3,912,253

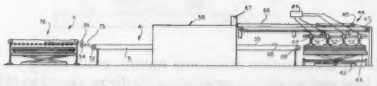
ENTRY AND EXIT STACKING SYSTEM

David J. Jarman, P.O. Box 181 R.R. 3, Aurora, Ind. 47001

Filed Oct. 23, 1973, Ser. No. 408,457

Int. Cl.² B65H *29/36, 3/08*

U.S. Cl. 271—5 **8 Claims**



1. A stacking system for use in handling sheet material said stacking system comprising:

main conveyor means for moving said sheet material;

said main conveyor means having an input side where sheet material is fed onto said main conveyor means and an output side where said sheet material is dispensed from said main conveyor means;

said main conveyor means moving said sheet material in a first direction going from said input side to said output side,

stacking means for stacking said sheet material received from the output side of said main conveyor means;

said stacking means comprising support means for setting individual sheets of said sheet material on a stack by sequentially laying portions of the individual sheets onto the stack, while supporting the rest of the sheet;

said support means comprising stacking conveyor means including endless chain means;

said endless chain means comprising a pair of spaced apart chains, each having a bottom level and a top level;

rollers sequentially attached across the bottom level of said pair of chains;

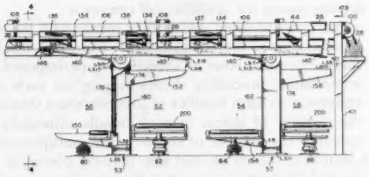
means for moving said chains so that the rollers are moved to the top level;

means for transferring said sheet material from said main conveyor to said support means, while said rollers are at the bottom level so that the entire sheet material is supported by the rollers on the bottom level;
means for thereafter moving said chains;
means for retaining said sheet material in place while said chain and rollers are moving;
ball bearing means on said rollers so that said rollers rotate around their own axes while moving away from the bottom of said sheet material;
said sheet material dropping onto the stack bit by bit as said rollers are removed from the bottom thereof; and
said support means moving in a second direction opposite to said first direction for sequentially removing portions of said support means from said sheet, while being retained on the remaining portions of said sheet material so that said sheet material is set on the stack bit by bit without the marring of said sheet material, while being stacked.

3,912,254
VENEER SORTER AND STACKER

Curtis H. Woodruff, Eugene, Oreg., assignor to Cabax Mills, Eugene, Oreg.

Division of Ser. No. 374,095, June 27, 1973, Pat. No. 3,812,964. This application Jan. 7, 1974, Ser. No. 431,147
Int. Cl.[2] B65H *29/58*
U.S. Cl. 271—64 **4 Claims**

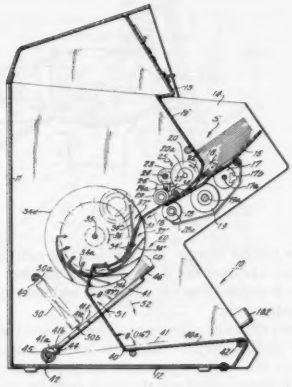


1. In a veneer sorting and stacking machine having means for conveying veneer sheet along a path of travel directed longitudinally of said machine,
a pair of bins for alternately receiving veneer sheets from said machine, said bins being disposed adjacent each other along said path of travel of said veneer sheets;
means for feeding veneer sheets to a selected one of said pair of bins;
veritical support means positioned intermediate said pair of bins and on either side thereof;
a pair of hoist arms diposed in each of said bins, said arms being supported by and vertically movable with respect to said support means, said hoist arms being disposed parallel to said path of travel of said veneer sheets for receiving veneer sheets fed to said selected one of said pair of bins; means for depositing said veneer sheets on said pair of hoist arms in said selected one of said pair of bins;
chain means entrained over said support means for movably connecting said hoist arm pairs so that as one pair of hoist arms in said selected one of said pair of bins is lowered, the other pair of hoist arms is raised in the other of said pair of bins;
said pairs of hoist arms being gravity operated by the weight of veneer sheets deposited on said pair of hoist arms in said selected one of said pair of bins; and
brake means mounted on said support means for selectively preventing movement of said hoist arm pairs.

3,912,255
STACKERS FOR DOCUMENT COUNTERS AND THE LIKE

George P. McInerny, Andalusia, Pa., assignor to Pennsylvania Research Associates, Inc., Cornwells Heights, Pa.

Filed Oct. 18, 1973, Ser. No. 407,411
Int. Cl.[2] B65H *29/40, 31/04*
U.S. Cl. 271—80 **11 Claims**



2. Stacker apparatus for receiving and neatly stacking documents, paper sheets, cards and the like comprising:
means for delivering documents along a delivery path and toward sad stacker in seriatum;
said stack apparatus including a plurality of rotary fans, each fan having a plurality of flexible curved blades, adjacent blades of each fan forming pocket means for receiving documents fed along said delivery path;
a stationary plate positioned between said fans and in the path of said documents for sequentially freeing documents from said pocket means as the fans rotate;
a swingable arm pivoted at a first end and extending through an opening in said plate, said plate being positioned intermediate the ends of said arm, the free end of said arm extending through said plate having a platform positioned substantially below said rotary fans;
the free ends of said fan blades being adapted to rapidly urge documents downwardly toward said platform as soon as the documents are free of their respective pocket means;
said platform being urged downwardly by the weight of the collected documents as well as by the rotary fan blades which slicably engage the stack of documents to move the leading and trailing edges of stacked documents increasingly further away from said delivery path to prevent stacked documents from interfering with the stacking operation.

3,912,256
SHEET STRIPPING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING APPARATUS

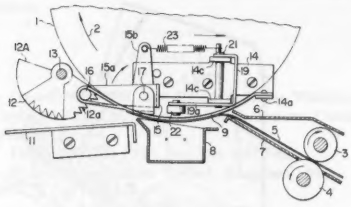
Yasumori Nagahara, Yokosuka, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,213
Claims priority, application Japan, Dec. 29, 1972, 48-4409[U]
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 **5 Claims**

1. In an electrophotographic printing apparatus, having a continuously rotating cylindrical drum, means for feeding a copy sheet into engagement with the periphery of the drum

and means for receiving the printed copy sheet, the improvement comprising:

a. a sheet stripping member having one end engaging one marginal portion of the drum periphery and positioned between the drum periphery and one lateral margin of the copy sheet, and having a second end extending substantially tangentially from the drum periphery such that the



one lateral margin and the leading margin of the copy sheet ride over the sheet stripping member and disengage the drum periphery as the drum and the copy sheet rotate together; and

b. sheet stripping claw means spaced from the drum periphery and adapted to catch the leading margin of the copy sheet after it disengages the drum periphery to direct the copy sheet away from the drum onto the receiving means.

3,912,257

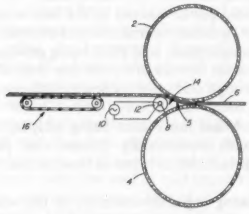
DETACKING APPARATUS

Carl B. Gibbons, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,265

Int. Cl.[2] B65H *29/56*

U.S. Cl. 271—174 **6 Claims**



1. In a machine having means for transporting along a predetermined path, a sheet or web material of the type having a tendency to adhere to the transporting means and move in a different path under the influence of electrostatic charge on the material, a detacking apparatus comprising:

a. a member positioned in close proximity to the predetermined path and having an inner conductive portion and an outer insulating portion facing the material; and

b. means for applying a source of periodically varying electrical potential to said conductive portion, said source being of a frequency such that at least one attractive field is created and dissipated between said member and the material as the leading edge of the material advances to a position along the predetermined path proximate to said member, the peak strength of said field being sufficient to overcome the electrostatic attraction of the material for said transporting means.

3,912,258

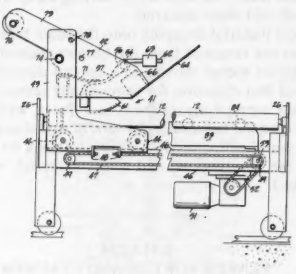
CONVEYOR SYSTEM FOR CONVEYING SHEETS

Merrill D. Martin, No. 2 Mall Court, Oakland, Calif. 94611

Division of Ser. No. 276,088, July 28, 1972, abandoned. This application Dec. 5, 1973, Ser. No. 421,957

Int. Cl.[2] B65H *29/58*

U.S. Cl. 271—184 **14 Claims**



1. In a conveyor system for conveying sheets from a multiple-cut sheet making machine to a stacking device, said system including,

a means for discharging multiple-cut sheets from said machine in substantially parallel rows,

side take-off conveyor receiving each row of sheets from said discharge means and moving said sheets sideways relative to the direction of discharge from said discharge means onto said stacker device,

a driving means for said take-off conveyor,

a means synchronizing said driving means with the velocity of discharge of the rows of sheets from said machine so that subsequent rows of sheets are superimposed on the immediately preceding sheets moving on such take-off conveyor, to form bundles of superimposed sheets where the number of sheets in each bundle ultimately correspond to the number of sheets in the multiple-cut, and

an abutment means on said side take-off conveyor spaced on said discharge means at a distance about equal to the width of said sheets for aligning said sheets with said discharge means,

the improvement in combination therewith comprising,

a plurality of abutment members forming said abutment means, each member having a side inclined away from said take-off conveyor and toward said discharge means to accommodate sheets thereunder,

a means supporting said abutment members individually swingable,

an adjustable means to counterbalance the weight of each abutment member, said counterbalancing being adjusted gradually in the direction of motion of said sheets on said side take-off conveyor to increase the counterbalancing action as the sheets form bundles during their movement along said side take-off conveyor.

3,912,259

APPARATUS FOR TIMED EVENTS PERFORMED BY CYCLISTS

James Edward Manuel, P.O. Box 627, Port Jefferson, N.Y. 11777

Filed Mar. 22, 1974, Ser. No. 453,805

Int. Cl.[2] A63K *1/00;* **G07C** *1/24;* **G09F** *9/00*

U.S. Cl. 272—4 **13 Claims**

1. In an apparatus for use in timed events performed by cyclists, the combination of

a combination timing device and primary course marker; and

course-defining means;

said combination timing device and primary course marker comprising, in combination

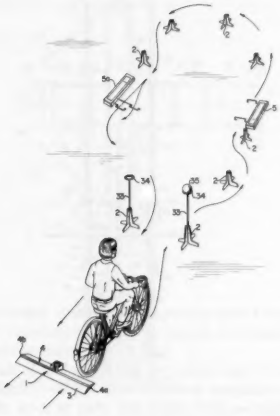
a frame adapted to be supported on the surface over which a cyclists' event is to be performed,

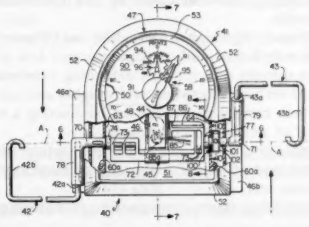
clock means for timing a timed event, said clock means being carried by said frame and having a control device movable between a first position, in which the clock means is held inactive, and a second position, in which the clock means is allowed to operate; and

actuator means projecting laterally from said frame and including

a first actuator element means observable as a target to be traversed by the wheel of a cycle on entry of the cycle to the course, and

a second actuator element means observable as a target to be traversed by the wheel of a cycle on departure from the course, said first and second actuator element





means being spaced apart in a direction extending transversely of said frame and constructed and arranged such that said control device is moved to its first position by said first actuator element means in response to said first actuator element means being traversed by a cycle wheel and said control device is then moved to said second position by said second actuator element means in response to said second actuator element means being traversed by a cycle wheel, whereby said actuator means provides activation and deactivation of said clock means through said first and second actuator element means thereof,

said course-defining means being adapted to be placed to define a closed course commencing with said first actuator element means of the combination timing device and primary course marker and ending with said second actuator element means.

3,912,260

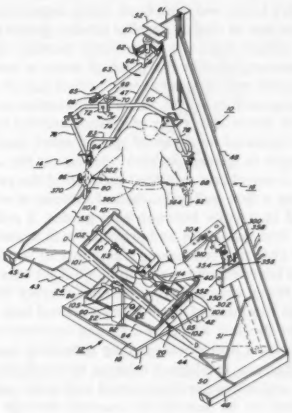
SKIING SIMULATOR

Walton M. Rice, 608 Godshall Road, Franconia, Pa. 18924

Continuation-in-part of Ser. No. 313,198, Dec. 7, 1972, abandoned. This application July 12, 1974, Ser. No. 488,060

Int. Cl.[2] A63B *69/18*

U.S. Cl. 272—57 B **61 Claims**



33. The combination comprising

a pair of foot supports, and

a foot support structural means for simultaneously moving said pair of foot supports up and down along the length of a first axis whose inclination may be alternated about a second axis from one position to another and simultaneously pivoted back and forth about a third axis alternately from one position to another.

3,912,261

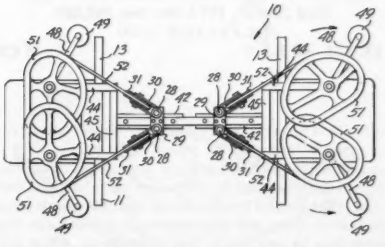
EXERCISE MACHINE

Lloyd J. Lambert, Sr., 1538 College Ave., Houston, Tex. 77034

Filed July 12, 1973, Ser. No. 378,386

Int. Cl.[2] A63B *21/02, 23/02*

U.S. Cl. 272—58 **1 Claim**



1. In an exercising machine for developing women's bustlines and men's pectoral and deltoid muscles, a frame having pairs of spaced parallel posts, each pair of posts being supported on one of a pair of spaced parallel base members, the spaced pairs of posts converging slightly toward the upper ends, horizontal transverse frame members connecting each pair of posts at spaced points therealong, a base frame member extending between and connecting the base member centrally thereof, an upper horizontal frame member extending between and connecting the frame members intermediate

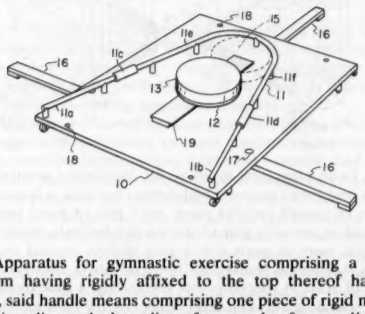
their opposite ends, an upright seat post extending upwardly from a foot on each side of the machine, a horizontal brace extending from a transverse frame member intermediate the opposite ends thereof to the upper end portion of the seat post, a pair of tubular braces extending from the base member to said foot, a padded seat mounted on the seat post and having a padded back extending upwardly therefrom, said padded back being supported on a transverse frame member adjacent it's upper end and on a block supported on a post adjacent it's lower end, said back being sloped away from the seat, a first pair of spaced parallel tubular guides extending in parallel relation from the base frame member to the upper frame member between the pairs of posts, a second pair of tubular guides mounted adjacent the first pair of guides, said guides being each provided with a compression spring encompassing it's lower end, pairs of spaced parallel upright posts members mounted on a pair of spaced apart base blocks that are arranged in spaced parallel relation on the upper frame member, a swivel arm mounted on each of the post members and having a first pulley journalled therein, a second pulley journalled in a yoke between said guides, a rod depending vertically from said yoke and provided with a conical point on it's lower end, said rod having a plurality of vertically spaced horizontal bores therein, a plurality of weight bars each having a pair of bores adjacent opposite ends thereof throughwhich said guides extend, said bars having a central bore with its axis parallel to the last named bores and intermediate the last named bores, a horizontal opening extending transversely of each of the bars in aligned relation to the bores in the rod when the rod is completely inserted within the weight bars, a pin adapted to be selectively inserted through one of the openings in a weight bar and through the aligned bore in the rod, a weight element on top of the stack of bars provided with guide collars, a pair of spaced parallel arms secured to each of the transverse frame members and extending outwardly therefrom, the inner ends of the arms being connected by transverse frame pieces, a tubular upright bearing secured to the outer ends of each of the arms, a shaft journalled in said bearing, a crank arm on the lower end of each of the shafts having a padded roller journalled on it's lower end for rotation about a vertical axis, an L-shaped stop secured to the shaft for engagement with the arm, an eccentric pulley secured to the upper end of each of the shafts, a cable trained under said second pulley in the yoke and over the first pulleys, and said cable having it's opposite ends secured on the adjacent eccentric pulleys.

3,912,262

GYMNASTIC, RECREATIONAL AND INSTRUCTIONAL APPARATUS

Karl Micko, 3419 W. 119 St., Cleveland, Ohio 44111

Filed July 17, 1973, Ser. No. 380,087
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—60 R **5 Claims**



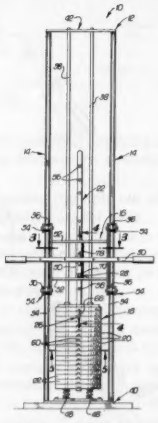
1. Apparatus for gymnastic exercise comprising a rigid platform having rigidly affixed to the top thereof handle means, said handle means comprising one piece of rigid material being disposed along lines from each of two adjacent corners of said platform to the midpoint of the opposite edge of said platform, said handle means being adapted for grasping; at least one headrest disposed substantially within the area defined by said adjacent corners and opposite edge; and at least one supporting member on the bottom of said platform substantially in the center thereof, wherein said supporting member is of substantially the same size as said headrest, and has a substantially arcuate cross-section.

3,912,263

EXERCISING MACHINE

Stephen John Yatso, 3132 E. Pico Blvd., Los Angeles, Calif. 90023

Continuation of Ser. No. 355,419, April 30, 1973, abandoned. This application May 28, 1974, Ser. No. 473,380
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—81 **14 Claims**



1. In an exercising machine, the combination of:
a. an upright frame providing generally vertical tracks;
b. a carriage movable upwardly and downwardly along said tracks;
c. a stack of weights carried by said frame substantially directly below said carriage;
d. an upright selector post extending substantially directly and vertically between said weights and said carriage;
e. lower connecting means for connecting a selected number of weights to said post;
f. upper connecting means for connecting said carriage to said post at any of a plurality of vertically spaced positions; and
g. exercising means connected to said carriage.

3,912,264

GYMNASTIC APPARATUS

Fritz Busse, Hilden; Hans-Walter Busch, and Günter Dungs, both of Solingen, all of Germany, assignors to Firma Bremshey Aktiengesellschaft, Solingen-Ohligs, Germany

Filed Apr. 25, 1973, Ser. No. 354,431
Claims priority, application Germany, Apr. 26, 1972, 2220436; Apr. 12, 1973, 2318374; Apr. 12, 1973, 2318455; Apr. 12, 1973, 2318456
Int. Cl.[2] A63B *09/06*
U.S. Cl. 272—72 **11 Claims**

1. A gymnastic apparatus comprising:
an elongated rail structure including:
a pair of upwardly bowed spaced apart rails,
a carriage shiftable on said rails along a path from a center position to opposite sides thereof,

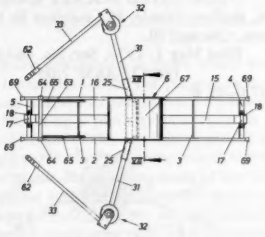
a traverse connected to said rails and lying below said path, and

spring means for biasing said carriage toward said center upon displacement to opposite sides thereof;

a pair of opposing transverse arms projecting inclinedly upwardly and outwardly from said structure at said center thereof and clearing said rails;

mounting means at said traverse and removably receiving each of said arms and securing same against movement relative to said structure;

a respective oar-handle lever articulated at the free end of each of said transverse arms for swinging movement about a respective pivot axis in a rowing motion, said carriage being shiftable on said rails to opposite sides of said pivot axes;



a respective brake at each of said pivotal axes for providing frictional resistance to the swinging movement of the respective oar-handle lever; and

means at each of said pivot axes for rendering the respective brake effective to provide frictional resistance to each oar-handle lever in only one sense of its swinging movement while rendering the brake ineffective and permitting free swinging movement in the opposite sense, said mounting means comprising:

a shoe form-fitting into said structure and engaging said traverse; and

a pair of upwardly and outwardly extending sleeves fixed to said shoe and forming sockets receiving the respective arms.

3,912,265

FLUID FLOW RESISTANCE EXERCISER HAVING SELECTIVELY REVERSIBLE FLUID FLOW CONTROL MEANS

Arthur M. Muir, 207 Van Doren Drive, Natrona Heights, Pa. 15065

Filed Sept. 19, 1974, Ser. No. 507,517

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—79 C **16 Claims**

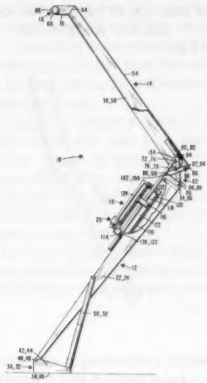
6. A fluid flow resistance exerciser comprising:

a base arm, said base arm having a first end provided with means for supporting said exerciser, said base arm being pivotally attached to said support means;

an operating arm, said operating arm being pivotally attached at a first end therof to a second end of said base arm;

a grip bar secured to a second end of said operating arm;

a hydraulic cylinder assembly pivotably attached to one of said base and operating arms and having first and second internal fluid chambers, said chambers being separated by a slideable internal piston and being in fluid communication with each other through a fluid flow passage, said piston carrying a piston rod having a portion exterior of said cylinder, said exterior portion of said rod being pivotably secured to the other of said base and operating arms; and



a selectively reversible fluid flow control means positioned in said fluid flow passage between said chambers and providing resistance to fluid flow between said chambers.

3,912,266

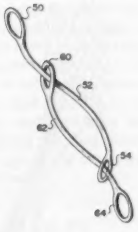
ELASTIC TYPE EXERCISING DEVICE

Max M. Gury, 57 Patton Drive, Bloomfield, N.J. 07003

Division of Ser. No. 332,389, Feb. 14, 1973, Pat. No. 3,838,852, which is a continuation-in-part of Ser. No. 198,728, Nov. 15, 1971, abandoned. This application July 22, 1974, Ser. No. 490,291

Int. Cl. A63b *21/00*

U.S. Cl. 272—82 **1 Claim**



1. An exercising device comprising a pair of resilient members, each said member having an elongated resilient center portion, each said center portion being substantially circular in cross-section, a first end of one of said members comprising a looped strap, said strap being integral with said first end, said looped strap having a substantially flat cross-section with a varying width, an opposite end of said one of said members comprising a looped strap larger than the looped strap at the first end of said one of said members, said opposite end looped strap being integral with said one of said members and having a substantially flat cross-section with a varying width, said pair of resilient members being in interlocking relation with one another with one of said ends of one of said resilient members being passed through one end of the other resilient member, and the end opposite from said one end of said other resilient member being passed through said other end of said one of said resilient members.

3,912,267
GAME RACKET

Edwin J. Lyon, 18 W. 231 Standish Lane, Villa Park, Ill. 60181

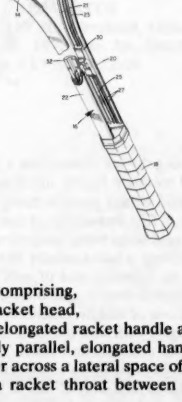
Filed Feb. 13, 1974, Ser. No. 442,112
Int. Cl.² A63B 51/00
U.S. Cl. 273—73 D 4 Claims

1. A game racket comprising a continuous tubular frame formed to have a head portion and a handle portion, a series of string holes formed in only the inner periphery of said head portion, a unitary string support member mounted inside the head portion of said tubular frame, said string support having a plurality of hook means thereon wherein said hook means extend through said holes and form a string support network inwardly of said inner periphery, a separate individual engaging member provided inside each of said hook means, and a single string being supported in each of said hook means in contact with said individual engaging members.

3,912,268
GAME RACKET

Mark L. Robinson, Newburyport, Mass., assignor to Acro, Inc., Stoneham, Mass.

Filed Feb. 19, 1974, Ser. No. 443,394
Int. Cl.² A63B 49/12
U.S. Cl. 273—73 H 11 Claims

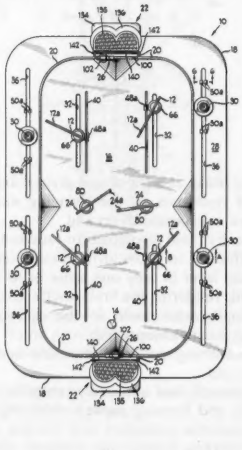


1. A game racket comprising,
means defining a racket head,
means defining an elongated racket handle and comprising spaced, essentially parallel, elongated handle legs which oppose each other across a lateral space of ½ to 2 inches, means defining a racket throat between said head and handle,
means defining a handle grip portion,
means defining a lateral strut assembly extending between said handle legs and located on said handle between said throat and said grip and comprising a thin tension member for holding said handle legs against separation from each other under conditions of racket loading and transmitting torsional and bending stresses from leg to leg, and plural separate and spaced apart means for engaging ends of said tension member to said legs in mechanically locked but unbonded engagement allowing flexural movement within said handle,
each of said legs having an outwardly facing surface portion, said outwardly facing surface portions of said legs being essentially parallel to each other,
said engaging means comprising portions which engage the handle legs at said outwardly facing surface portions,
the material of the tension member having a higher endurance limit than the handle material.

3,912,269
SIMULATED HOCKEY GAME

Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed May 1, 1974, Ser. No. 465,832
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 B 12 Claims

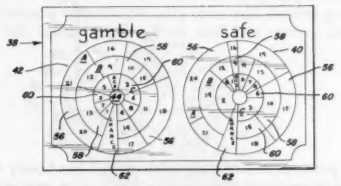


5. A skill type game of the type resembling a hockey game, comprising: a playing surface having at least one goal area; a puck-like game object slidably supported on the playing surface; a housing upon which the playing surface is supported; at least one simulated player on the playing surface for reciprocating movement in a direction generally toward and away from the goal area; carriage means slidably mounted on the housing; means mounting the simulated player on said carriage means for reciprocating movement therewith; a manually operable knob on the carriage means exposed exteriorly on the housing for grasping by the user; operating means mounted on the carriage means and operatively associated with said knob for effecting swiveling movement of the player about an axis generally perpendicular to the playing surface; at least one simulated goal tender mounted on the playing surface for reciprocating movement in a direction generally transverse to the movement of the simulated player; and link means operatively associated with the carriage means and the simulated goal tender for selective movement of the goal tender in response to movement of the carriage means whereby the user may attempt to prevent the game object from entering the goal.

3,912,270
SPORTS GAME BOARD AND VARIABLE PROBABILITY CONTROLLERS

Martin M. Trossman, 374 Washington Ave., Brooklyn, N.Y. 11238, and Parker Smith, 470 10th St., Brooklyn, N.Y. 11215

Filed Mar. 30, 1973, Ser. No. 346,604
Int. Cl. A63b *71/02*
U.S. Cl. 273—87.2 **2 Claims**



2. A sports game comprising a game board portraying a reduced scale representation of the playing field associated with the sport and adapted to have thereon a plurality of game moves; means including a plurality of indicia on said game board for locating each of the possible results of said moves on corresponding portions of said game board; variable probability controller means for selecting each of the moves to be plotted on said game board, said controller means including a plurality of control elements, each of said control elements defining an array of concentric rings each designating one of the selectable moves the results of which are to be plotted on said game board, there being one ring for each selectable move; each of said control elements further including means designating the possible results of each of the selectable moves to be plotted on each game board defined by each of said rings being divided into a plurality of unequal segments, each segment defining one of the possible results of the moves designated by said ring, the corresponding rings of each control element designating the same move and including a segment for each possible result of the move designated thereby; said move result designating means of each said control elements defining a probability for selection of the possible results of each move, said move result designating means of one control element defining a probability of selection of at least some of the results of at least one move different from the probability for those results defined by the move designating means of another of said control elements in that at least one of the segments in each corresponding ring designating the same result of the same move being unequal, whereby the probability of selection of said one result of said move differs as a function of the control elements utilized; each control element including at least one segment corresponding to each of said indicia; means uniquely identifying each of said indicia and the corresponding segments of said control elements; each of said indicia including means defining an additional characterization thereof governing a selection of the control element to be used for the next move, whereby the probability of the selection of various results of at least some moves is determined by the results of a previous move.

3,912,271
PROJECTING RAMP AND MATING IMPELLER

Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212

Continuation-in-part of Ser. No. 479,282, June 14, 1974, abandoned. This application Mar. 17, 1975, Ser. No. 558,830
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 F **1 Claim**

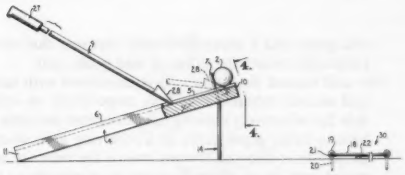
1. A game apparatus comprising:

a. a generally rectangular ramp member having an upper side with a longitudinal groove therein extending the length thereof; said groove having a bottom with a transversely arcuate shape; said ramp member being adapted for positioning on a supporting surface;

b. a support member engaged with said ramp member adjacent one end thereof and supporting same in a raised position whereby said ramp member is inclined upwardly toward said one end; said support member having an elongate base extending transversely of said ramp member and for a distance greater than the width of said ramp member and having upwardly and inwardly inclined legs extending from said base;

c. stop projections on the upper portion of said ramp member and spaced from said one end, said stop members having a greater lateral spacing than the width of the groove and upstanding from said ramp member on opposite sides of said groove; said legs of the support member having portions extending through said ramp member and forming the stop projections;

d. a projectile having a width greater than the spacing between said stop projections and adapted to be positioned in said groove between said stop projections and said one



end of the ramp member, said stop projections retaining said projectile from moving down said ramp member;

e. a projectile impelling means movable in said groove up said ramp member to strike said projectile and impel same from said ramp member into the air, said impelling means having a head movable in said groove and of less width than the space between said stop projections with an elongate shaft extending therefrom and terminating in a gripping portion, said head having an upwardly and rearwardly inclined face for striking said projectile, said impelling means having a transversely arcuate shaped bottom fitting and rotatable laterally in said groove;

f. said impelling means being movable in said groove up said ramp member with the shaft at selected inclinations relative to the ramp for selected relative inclination of the inclined face on the inclined face on said head on impact with the projectile and rotatably transversely in said groove generally about the longitudinal axis to vary the trajectory of the flight of the projectile both in elevation and in lateral deflection.

3,912,272
GAME APPARATUS

Alan A. Hicks, Wilmette, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 375,666, July 2, 1973, abandoned. This application July 8, 1974, Ser. No. 486,306
Int. Cl.² A63F *7/00*
U.S. Cl. 273—119 R **12 Claims**

1. A game apparatus comprising:

a playing surface along which a projectile may be moved, said surface having opposed ends and first and second opposed sides;

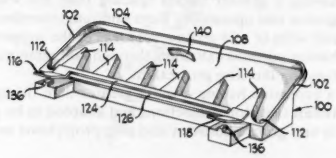
a projectile movingly supported on said surface;

means at each of the opposed ends defining a goal toward which the projectile can be directed;

a plurality of spaced apart projections on said surface adjacent said first side extending inwardly therefrom and abutting a substantially unimpeded portion of said surface extending between said opposed ends, the area of the

surface between each successive pair of projections on the first side defining a projectile receiving area for receiving a projectile;

a plurality of pairs of movable members mounted on the first side, one pair for each receiving area, said members being adapted to strike a projectile in a receiving area, each pair of movable members including a first movable member that directs a projectile generally toward one of



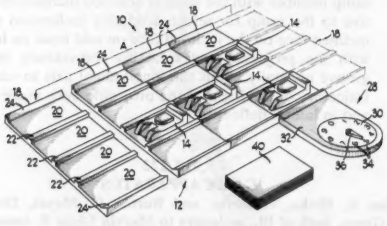
said goals and a second movable member that directs a projectile toward the other of said goals; and

first and second actuating means associated with said first and second movable members respectively on said first side for selectively moving the associated movable members to strike a projectile in a receiving area whereby a projectile is directed toward one or the other of the opposed ends in an effort to move the projectile to a goal.

3,912,273
RACING GAME APPARATUS

Gordon A. Barlow, Skokie, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 13, 1975, Ser. No. 549,718
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 CA **8 Claims**



1. A racing game apparatus, comprising:

a plurality of manually manipulatable playing pieces;

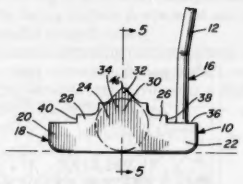
a racing track defining a plurality of side-by-side elongated lanes along which said playing pieces are movable, said track comprising a plurality of separate transverse track sections each having adjacent side-to-side lane portions whereby the track sections when placed end-to-end define said elongated lanes, and whereby the track sections can be individually moved from the rear end of the track to the front end of the track to thereby selectively lengthen the track during play; and

a plurality of instruction cards having indicia thereon for dictating the movement of the playing pieces along the track from one lane to another.

3,912,274
PUTTER HEAD WITH DIRECTION AND CENTERING ARROW

Jack L. Brace, 404 Avenue B, Bryan, Ohio 43506

Filed Aug. 23, 1974, Ser. No. 500,175
Int. Cl.² A63B 53/04
U.S. Cl. 273—164 **1 Claim**



1. A putter club including an elongated head body substantially rectangular in plan outline and having opposite ends, front and rear sides, and upper and bottom sides, said upper side lying in an imaginary horizontal plane, one end portion of said head including an upwardly projecting shank and the front side of said head including a substantially vertical planar face, an upper marginal portion located in the central area of said upper side and being substantially coplanar with said face, centrally intermediate the opposite end portions of said body, extending upwardly from said imaginary plane and comprising an upward extension having

a. low opposite end portions extending upwardly from said upper side and forming a first pair of oppositely disposed parallel edges extending transversely to the longitudinal axis of said head and constituting a first pair of alignment lines,

b. an elevated central zone upwardly extending from said low opposite end portions, spaced inwardly an equal amount from said first pair of edges and forming a second pair of oppositely disposed parallel edges extending transversely to the longitudinal axis of said head and constituting a second pair of alignment lines and

c. an upwardly tapering center peak centered relative to said elevated central zone and constituting a third edge extending transversely to the longitudinal axis of said head and disposed parallel to said first and second pairs of edges a depressed rearwardly and upwardly opening recess defined immediately behind said front side and extending downwardly into said body and rearwardly to said rear side, said recess having oppositely disposed parallel surfaces aligned substantially in the same vertical parallel planes encompassing said first pair of edges, said body including a generally planar undersurface whose opposite end portions curve upwardly and merge into upstanding end faces of said body defining said opposite ends.

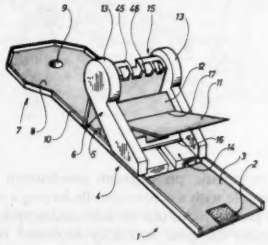
3,912,275
MINIATURE GOLF COURSE

Torvald Hagelberg, Molnlycke, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

Filed Feb. 4, 1974, Ser. No. 439,070
Claims priority, application Sweden, Feb. 6, 1973, 7301590; Sept. 25, 1973, 7313009
Int. Cl.³ A63B 67/02
U.S. Cl. 273—176 FA **10 Claims**

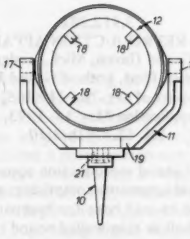
1. A miniature golf course comprising a first section including a starting zone, a middle section extending from one end of said first section and a last section extending from the opposite end of said first section and having a number of obstacles located thereon, and a last section extending from the opposite end of said middle section from said last section and including a finishing zone with a hole or other ball-catching device, wherein the improvement comprises that said

middle section comprises a substantially level playing ground, a pivotally mounted shutter means located above said playing ground, said shutter means including support means located above said playing ground for supporting said shutter means for pivotal displacement between a first position in which an edge of said shutter means contacts said playing ground and forms a playing surface sloping upwardly from said playing ground and said playing surface extending from the location of contact with said playing ground in the direction from said first section toward said last section and a second position wherein the edge which contacts said playing ground in the first position is spaced upwardly from said playing ground so that a ball can be played from said first section over said



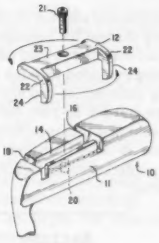
playing ground towards said last section passing under said shutter means, a first obstacle means mounted on said playing ground below said shutter means and said first obstacle means including a plurality of movably displaceable obstacles thereon selectively positionable relative to said playing ground for affording a variety of obstacles on said playing ground and second obstacle means mounted on said shutter means at a position thereon spaced from the location at which said shutter means contacts said playing ground in the first position and said second obstacle means including a plurality of movably displaceable obstacles thereon selectively positionable relative to said playing surface on said shutter means for affording a variety of obstacles on said playing surface.

3,912,276
PRACTICE PUTTING DEVICE
Charles Augustus Keicher, 27, Fair Way, Northway, Tewkesbury, Gloucestershire, England
Filed Sept. 30, 1974, Ser. No. 510,707
Claims priority, application United Kingdom, Sept. 29, 1973, 45652/73
Int. Cl.[2] A63B *57/00, 71/00*
U.S. Cl. 273—177 A **3 Claims**



1. Golfing equipment comprising a receiver which is open at one end to enable it to receive a golf ball, a stirrup having pivot means for mounting the receiver for pivotal movement relative to the stirrup about a generally horizontal axis, and mounting means enabling the stirrup to swivel about a substantially vertical axis, the configuration of the receiver and the disposition of the axis about which the receiver pivots relative to the stirrup being such that the receiver is normally biassed into an inclined position in which the lip of the receiver at said one end is in the same place as the path of a ball projected towards the receiver, the receiver being arranged to pivot in response to passage of a ball into the receiver and beyond said pivot axis into a position in which the other end of the receiver is at a lower level than said one end, said other end of the receiver being substantially open and circumferentially spaced projecting means being provided at said other end to arrest a ball travelling with a velocity less than a predetermined velocity whilst allowing a ball travelling with a velocity greater than said predetermined velocity to pass therethrough.

3,912,277
GOLF CLUB
David Todd Pelz, 13129 Oriole Drive, Beltsville, Md. 20705
Filed July 22, 1974, Ser. No. 490,909
Int. Cl.[2] A63B *69/36, 53/06*
U.S. Cl. 273—186 A **8 Claims**



1. A golf club selectively usable for practicing golf or for playing the game of golf comprising in combination a club head having a ball striking face and said striking face having a center of percussion, a unitary attachment for the club head of predetermined mass having two positions of use on the club head relative to said ball striking face, said attachment including spaced elements which in a first of said two positions of use project forwardly of said ball striking face on opposite sides of said center of percussion to thereby form a restricted practice target area on said ball striking face, said unitary attachment in the second of said two positions of use having said spaced elements disposed away from said striking face so that the entire striking face including the center of percussion is clear and without irregularities and therefore adapted for regular play, the total mass of said attachment and said club head remaining the same in either of said two use positions of the attachment so that the user of the club will experience the identical club feel when practicing or playing golf, and interengaging coupling means on the club head and attachment for securing the attachment to the club head in either of said two use positions.

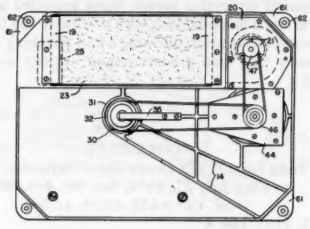
3,912,278
DISK DRIVE ASSEMBLY
Marvin W. Teutsch, Phoenix, Ariz., assignor to International Memory Systems, Scottsdale, Ariz.
Filed July 22, 1974, Ser. No. 490,574
Int. Cl. G11b *1/00*
U.S. Cl. 274—1 R **12 Claims**

1. An integrally formed base unit for a disk drive having at least first and second major surfaces comprising:

a plurality of component mounting faces on said first major surface of said base unit for supporting components to be mounted thereon, said component mounting faces being located at predetermined distances from one another and in predetermined planes relative to one another;

a fan shroud member formed as part of said base unit on said second major surface thereof for receiving a fan and directing the air flow produced thereby;

a filter housing chamber formed as part of said base unit on said second major surface thereof with walls extending from said second major surface a predetermined amount therefrom, the open side of said chamber formed by said walls opposite said second major surface being adapted for closure by a cover plate, one of said walls being common with a portion of said fan shroud member and having a first opening therein for permitting passage of air from said fan shroud member to said filter housing chamber, a second opening provided through said base unit into said filter housing chamber at a point remote from said first opening to permit air to pass out of said chamber to a point above said first major surface of said base unit; and means formed in said base unit for mounting a drive motor in a predetermined location relative to said fan shroud member.



3,912,279
OPERATING PROGRAM CONTROL FOR A RECORD PLAYBACK DEVICE

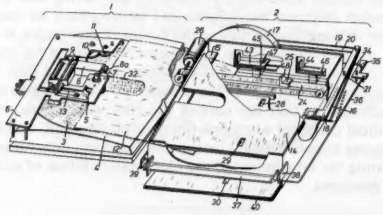
Bruno Paul; Jurgen Wilisch, and Rainer Ihlenburg, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken-Teldec, Zug, Switzerland

Filed Aug. 14, 1974, Ser. No. 497,386

Claims priority, application Germany, Aug. 14, 1973, 2341034; Aug. 14, 1973, 7329657

Int. Cl.² G11B *17/10, 17/04, 5/82*

U.S. Cl. 274—10 R **6 Claims**



1. A program control disc for controlling the operation of a record player having an automatic record changer and means for driving the disc, said disc being provided with a plurality of function control members each arranged to control a respective function of the record player and its associated changer, and said disc comprising: a first part carrying a first group of said control members and arranged to be directly driven by the driving means; and a second part carrying a group of said control members; and coupling means arranged to connect said second part to the driving means in a selectively disconnectable manner, whereby said second part can be stopped while said first part is driven when the functions controlled by said second part are to be suppressed.

3,912,280
AUTOMATIC MECHANISM FOR USE IN PHONOGRAPH

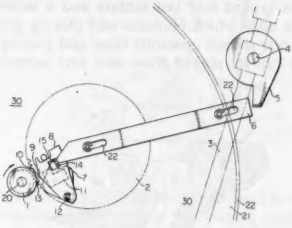
Isamu Nakadaira, and Takashi Saito, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Dec. 14, 1973, Ser. No. 424,888

Claims priority, application Japan, Dec. 15, 1972, 47-143935

Int. Cl.² G11B *17/02*

U.S. Cl. 274—1 L **4 Claims**



1. In an automatic phonograph mechanism of the type having a turntable with a center spindle having a radial projection; a drive pinion mounted on said center spindle to rotate therewith; a second gear rotatably mounted opposite said drive pinion to engage therewith, said second gear having a portion free of gear teeth normally positioned opposite said drive pinion so that said drive pinion and said second gear are disengaged; a first pawl and a second pawl pivotally mounted on said second gear, said first pawl superimposed on said second pawl and in frictional contact with said second pawl, said first pawl having an extending portion extending toward said center spindle; a slide cooperative with a pickup arm for pivoting said second pawl toward said center spindle as the pickup arm advances toward the center of said turntable, said first pawl in frictional contact with said second pawl pivoting therewith to effect engagement between the radial projection of said spindle and the extending portion of said first pawl to advance said second gear to engage said drive pinion to effect one complete revolution of said second gear, wherein the improvement comprises:

a sheet-like member interposed between said first and second pawls to effect frictional contact with said first and second pawls, said sheet-like member having one uneven surface effective to prevent excessively high frictional forces and seizure between said one uneven surface and an adjacent one of said pawls and effective to reduce variations in the coefficient of friction between said uneven surface and the adjacent one of said pawls, whereby excessive rebounding of said first pawl upon contacting the radial projection of said center spindle is prevented.

3,912,281
SOUND REPRODUCTION APPARATUS

Stephen A. Platt, Grand Haven, Mich., assignor to Stephen A. Platt and Vernet B. Platt, both of Grand Haven, Mich.

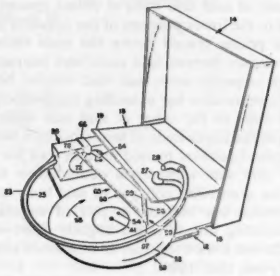
Continuation-in-part of Ser. No. 219,105, Jan. 19, 1972, abandoned. This application May 14, 1973, Ser. No. 359,795

Int. Cl. G11b *3/10*

U.S. Cl. 274—16 **29 Claims**

1. A mechanical sound reproduction apparatus for use with disk recordings, said apparatus comprising: a base; a turntable rotatably mounted to said base for receiving and rotating a disk recording; a hollow thin-walled sound tube having a first open end and a second open end; means for pivotally coupling said first open end of said sound tube to said base for horizontal and vertical movement; a relatively flat and rigid sound board flexibly coupled to an edge of said second end of said sound tube such that a clearance exists between a portion of the edge of said sound board and the corresponding portion of said second end of said sound tube to allow said sound

board to freely vibrate; means for mounting a stylus adapted to fit within a groove in a disk recording, to an edge of said sound board adjacent said clearance so that stylus vibrations



carried by information recorded in the groove are transmitted to said sound board which generates audible sound waves in said sound tube.

3,912,282

RECORDING AND REPRODUCING APPARATUS USING FLEXIBLE RECORDING MEDIA

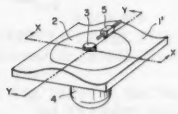
Kazuhiko Sano, Toyonaka; Tokiharu Nakagawa, Hirakata, and Shoji Omiya, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 2, 1973, Ser. No. 412,450

Claims priority, application Japan, Nov. 17, 1972, 47-115797; June 7, 1973, 48-64271; June 20, 1973, 48-70027; July 24, 1973, 48-83453; June 15, 1973, 48-71456

Int. Cl.² G11B *3/60*

U.S. Cl. 274—39 R **11 Claims**



1. In combination a recording and reproducing apparatus having a recording and reproducing head, disk-shaped flexible recording medium, means for rotating said recording medium a stabilizing plate supporting said recording medium, said stabilizing plate having a cross section convexly curved along its longitudinal center line to form a ridge at the uppermost portion thereof and reversely curved at either side of its center portion to form a valley between the center portion and each edge thereof, said edge being higher than the bottom of said valley, means forming a passageway between said recording medium and said plate said disk-shaped flexible recording medium being supported above said stabilizing plate by an air cushion produced by the flow of air between said recording medium and said stabilizing plate during rotation of said recording medium and means for translating said head along said ridge of said stabilizing plate.

3,912,283

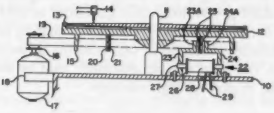
TURNTABLE SPEED LOCK SYSTEM

Robert James Hammond, Stevensville; Carl Wayne Miller, and Larry Fred Culver, both of Dowagiac, all of Mich., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 10, 1974, Ser. No. 504,486

Int. Cl.² G11B *3/60*

U.S. Cl. 274—39 **10 Claims**



1. A turntable speed lock system comprising:

1. a mounting plate;

2. a turntable mounted for rotation on said mounting plate, said turntable including a concentric ring member wherein said ring member has a plurality of permanently magnetized poles of alternate polarity along the periphery thereof;

3. means for driving said turntable to rotate at an average predetermined speed comprising:

A. a main motor, and

B. variable coupling means for transferring motion of said main motor to said turntable; and

4. a stator assembly fixedly mounted on said mounting plate, said stator assembly including:

A. a core having an airgap for receiving said rotatable turntable ring member, and

B. a field winding for establishing an alternating magnetic field across said airgap when energized, wherein said permanently magnetized poles travel in a circular path, a seriatim, through said airgap, wherein the reluctance across said airgap is minimum when said turntable is rotating at the predetermined speed, and wherein the coupling provided by said variable coupling means varies in a manner that enables said ring member/stator assembly to maintain said turntable rotation at the predetermined speed when the speed of the main motor is asynchronous with the predetermined speed.

3,912,284

SEALING ASSEMBLIES

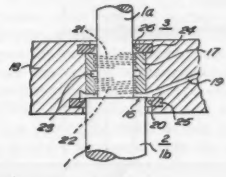
Alexander Bennett Gosling; Colin Howard Stanwell Smith, and Paul Castle, all of London, England, assignors to Decca Limited, London, England

Filed Nov. 23, 1973, Ser. No. 418,263

Claims priority, application United Kingdom, Jan. 23, 1973, 3486/73

Int. Cl.² F16J *15/40*

U.S. Cl. 277—18 **3 Claims**



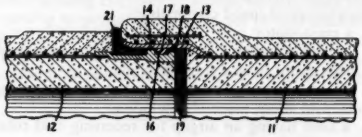
1. A sealing assembly for use with a shaft rotating between a region of high vacuum and a region containing a fluid at a working pressure, comprising a rotary shaft, a sealing element

encircling the shaft, a first seal including a helical passageway which is defined between the sealing element and the shaft, a second sealing comprising a lip seal encircling the shaft and spaced along the axis of said shaft from the first seal on the side thereof remote from the side of the assembly which is arranged to be adjacent the region of high vacuum, a third seal comprising another lip seal encircling the shaft between said first and second seals, a source of sealing fluid, means for applying sealing fluid to the shaft between the second and third seals, a housing which holds the sealing element and said seals, said shaft protruding through a bore in said housing, and a chamber for collecting any leakage of sealing fluid when said shaft is stationary, located in said housing adjacent the sealing element on the side of the assembly that is arranged to be adjacent the region of high vacuum.

3,912,285
CORROSION PROTECTIVE COLLAR FOR UNDERGROUND PIPE JOINTS WITH METAL PARTS

Harold V. Swanson, Morris Plains, and Robert E. Bald, Roseland, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Division of Ser. No. 359,967, May 13, 1973. This application Nov. 4, 1974, Ser. No. 520,802
Int. Cl.² F16J *15/10*
U.S. Cl. 277—207 **13 Claims**

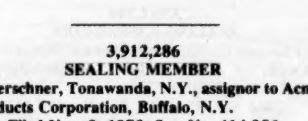


1. A joint for use between first and second continuous successive lengths of pipe, wherein a bell formed on an end of the first length has a ferric metallic bell ring affixed therein and a spigot formed on an end of the second length has a ferric metallic spigot ring thereon and wherein the spigot ring engages into the bell ring, the joint characterized by a distortable band of a cellular water invadable material impregnated with a dry hydratable cement which is reactive with water to hydrate thereby forming an alkali releasing water imprevious substance, the band positioned between the spigot and the bell and engaged by said engagement of the spigot ring into the bell ring.

3,912,286
SEALING MEMBER

James J. Kerschner, Tonawanda, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,356
Int. Cl.² F16J *15/02*
U.S. Cl. 277—225 **5 Claims**

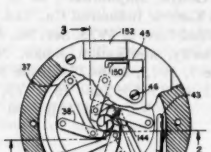


1. A sealing member comprising a resiliently yeildable, hollow tubular body, and a generally T-shaped formation formed integral with said body and having laterally extending wings overlying said tubular body in spaced relation thereto, said tubular body having a top wall, a bottom wall and opposite side walls and said T-shaped formation being joined to said top wall, said tubular body further including a pair of internal cross bars extending downwardly at an angle from the upper portions of said side walls at points spaced below the ends thereof to the lower portions of the opposite ones of said side walls at points spaced above the ends thereof and in supporting relation thereto, said cross bars intersecting intermediate their opposite ends, and said tubular body further including a compression bar extending transversely from one of said side walls to the other of said side walls below the intersection of the lower ends of said cross bars with said side walls in a spaced relation to said bottom wall for preventing buckling of said side walls upon compression thereof and facilitating the controlled collapse of said body and wherein said compression bar includes a pair of angularly related portions extending inwardly and slightly downwardly from said side walls and joined together at a common juncture at an angle slightly less than **180°**.

3,912,287
CHUCK APPARATUS

John C. Steinmetz, P.O. Box 672, Coer D'Alene, Idaho 83814

Continuation-in-part of Ser. No. 259,589, June 5, 1972, Pat. No. 3,838,540. This application Apr. 8, 1974, Ser. No. 459,050
Int. Cl.² B23B *31/12*
U.S. Cl. 279—35 **7 Claims**

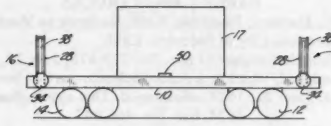


1. a. A chuck disposed around a center axis;
b. at least three solid one-piece jaws, each having an outer end portion and an inner end gripping portion, the jaws being pivotally mounted at their outer end portions on said frame, said jaws being equally spaced around said center axis and extending generally inwardly toward that axis so that said inner end gripping portions will converge toward said axis when said jaws are pivoted; and
c. means for controlling pivotal movement of said jaws toward and away from said axis so that each of said end gripping portions remains essentially the same distance from said axis as the other end gripping portions over a gripping range, said control means comprising a rotatable ring means having its center at said axis, and connector means connecting each of said jaws to said ring means, whereby rotation of said ring means effects equal pivotal movement for each of said jaws, said connector means for each jaw being a rigid link member pivotally connected at one of its ends to the jaw intermediate said end portions of the jaw and being pivotally connected at the other of its ends to the ring means.

3,912,288
VEHICLE LEVEL CONTROL

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,258
Int. Cl.² B60S 9/10
U.S. Cl. 280—6 H **1 Claim**

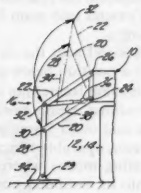


1. In a four cornered vehicle having right and left front wheels, and right and right and left rear wheels for overland transport of the vehicle: the improvement comprising means for anchoring and supporting the vehicle in a substantially level attitude on uneven or sloping terrain; said means comprising a jack means carried by the vehicle at each of its four corners, and electrical control means responsive to a tilted condition of the vehicle to selectively actuate the jack means for causing the vehicle to assume a substantially level attitude; said electrical control means comprising a miniature cruciform chamber which includes a central chamber area and four perimetrical chamber areas; said chamber being oriented on the vehicle so that a first perimetrical area is disposed in a left-forward location relative to the central area, a second perimetrical area is disposed in a right-forward location relative to the central area, a third perimetrical area is disposed in a left-rear-ward location relative to the central area, and a fourth perimetrical area is disposed in a right-rearward location relative to the central area; first, second, third and fourth sets of spaced contacts in respective ones of the perimetrical areas; the central area of the chamber comprising a floor that is at a lower elevation than the spaced contacts when the vehicle assumes a level attitude; and an electrically conductive liquid only partially occupying the chamber so that when the vehicle is in a level condition none of the contact sets is immersed in the liquid; the amount of liquid being sufficient that when the vehicle is tilted in any given direction the liquid gravitates in the chamber to bridge the set of contacts then in a lowered condition due to the vehicle-tilt action.

3,912,289
VEHICLE LEVEL CONTROL

Edward H. Czajkowski, Jr., 37042 Camelot, Apt. 185, Sterling Heights, Mich. 48077

Filed Aug. 21, 1974, Ser. No. 499,375
Int. Cl.² B60S 9/04
U.S. Cl. 280—6.1 **1 Claim**

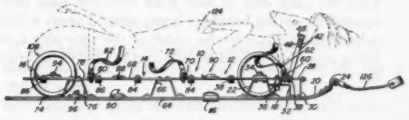


1. In a four cornered vehicle having right and left front wheels, and right and left rear wheels for overland transport of the vehicles: the improvement comprising means for anchoring and supporting the vehicle in a substantially level attitude on uneven or sloping terrain; said means comprising a jack means carried by the vehicle at each of its four corners, and electrical control means responsive to a tilted condition of the vehicle to selectively actuate the jack means for causing the vehicle to assume a substantially level attitude; said electrical control means comprising a miniature cruciform chamber which includes a central chamber area and four perimetrical chamber areas; said chamber being oriented on the vehicle so that a first perimetrical area, a second perimetrical area is disposed in a right-forward location relative to the central area, a third perimetrical area is disposed in a left-rearward location relative to the central area, and a fourth perimetrical area is disposed in a right-rearward location relative to the central area; first, second, third and fourth switch contacts disposed in respective ones of the perimetrical areas; a fifth switch contact disposed in the central chamber area; each of the perimetrical contacts being elevated relative to the fifth central contact when the vehicle assumes a level attitude; and an electrically-conductive liquid partially filling the chamber so that when the vehicle assumes a level attitude the central contact is immersed in the conductive liquid while none of the perimetrical contacts are so immersed; the amount of conductive liquid being sufficient that when the vehicle is tilted in any given direction the liquid gravitates in the chamber to bridge the chamber space between the central contact and the perimetrical contact that has been moved downward due to the vehicle-tilt action.

3,912,290
COLLAPSIBLE SLED

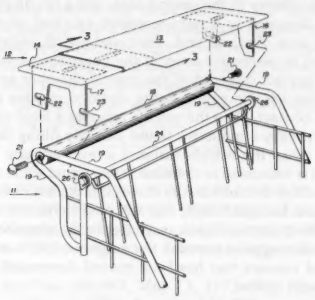
Robert S. Rich, 123 Crest Ave., Lancaster, Pa. 17602

Filed June 3, 1974, Ser. No. 476,160
Int. Cl.² B62B 13/18
U.S. Cl. 280—9 **8 Claims**



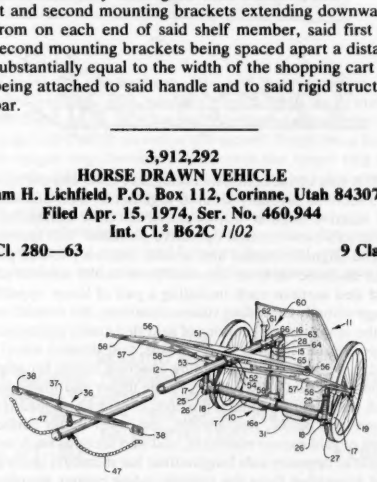
1. A sled construction including three end aligned elongated sled sections pivotally secured together at their adjacent ends for relative angular displacement about a horizontal transverse axis between first operative positions with said sections in end aligned position and second relatively folded positions with said sled sections disposed in vertically stacked relation, said sled sections each including a pair of lower opposite side longitudinally extending runner members, the central portions of the opposite end sections of said sled construction including opposite side support wheel means, said support wheel means and said end sections including coacting means for selectively supporting said wheel means in the upper and lower positions with the lower peripheral portions of said wheel means spaced above and below, respectively, the lower under surface portions of said runner members, said sled sections each including a pair of opposite side longitudinal bar members spaced above and supported from the corresponding runner members with bar members on each side of the sled disposed in opposing end-to-end relation when said sled sections are disposed in end aligned positions, said sled sections each including a plurality of upwardly concave arcuate braces extending and secured between corresponding longitudinally spaced portions of the corresponding bar members, said sled construction including front, intermediate and rear sled sections, the front ends of one pair of members of said intermediate sled sections being pivotally supported from the adjacent ends of the corresponding members of the adjacent sled section and the rear ends of the other pair of members of said intermediate sled section and the adjacent ends of the corresponding members of the adjacent sled section being pivotally supported from the adjacent ends of the corresponding members of the adjacent sled section.

3,912,291
SHOPPING CART SHELF ASSEMBLY
Donald H. Frisch, 6759 Mineral Drive, San Diego, Calif. 92119
Filed Aug. 2, 1974, Ser. No. 494,022
Int. Cl.² B62B *11/00, 5/00*
U.S. Cl. 280—33.99 A **3 Claims**



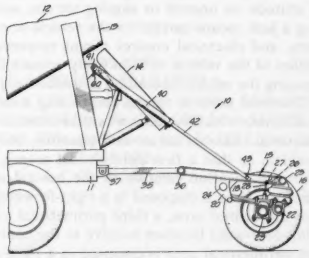
1. On a shopping cart of the type utilized by customers in retail outlets in which a substantially rectangularly cross-sectioned wire basket terminating in its upper rear portion in a rigid structural bar for carrying various items of merchandise is mounted on wheels or casters and has a rearwardly protruding handle parallel to said rigid structural bar for pushing the cart, the improved shelf assembly comprising:
a flat substantially rectangular shelf member; and
first and second mounting brackets extending downwardly from on each end of said shelf member, said first and second mounting brackets being spaced apart a distance substantially equal to the width of the shopping cart and being attached to said handle and to said rigid structural bar.

3,912,292
HORSE DRAWN VEHICLE
William H. Lichfield, P.O. Box 112, Corinne, Utah 84307
Filed Apr. 15, 1974, Ser. No. 460,944
Int. Cl.² B62C *1/02*
U.S. Cl. 280—63 **9 Claims**



1. A horse drawn vehicle comprising
a chassis having
an elongate tubular tongue,
a hanger bar depending from the tubular tongue intermediate its length,
a torsion bar extending transversely to said tongue and said hanger bar, fixed to said hanger bar intermediate its length,
a pair of spaced apart torsion arms adjacent each end of the torsion bar said torsion arms being fixed to and cantilevered from said torsion bar,
a wheel support arm pivotally connected, intermediate its length, to the end of each of the torsion arms,
a wheel for each pair of wheel support arms, means journaling each said wheel at ends of the pair of wheel support arms connected to each pair of torsion arms, and
a spring assist shock absorber pivotally connected at one end to the other ends of each pair of wheel support arms and having the other end fixed to the torsion bar.

3,912,293
RETRACTABLE LOAD BOOSTER ASSEMBLY FOR LARGE CARGO TRUCKS
Henry C. Harbers, Pasadena, Calif., assignor to Western Unit Corporation, City of Industry, Calif.
Continuation-in-part of Ser. No. 275,678, July 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 155,434, June 22, 1971, abandoned. This application May 1, 1974, Ser. No. 466,047
Int. Cl.² B60S *9/00*
U.S. Cl. 280—81 R **5 Claims**

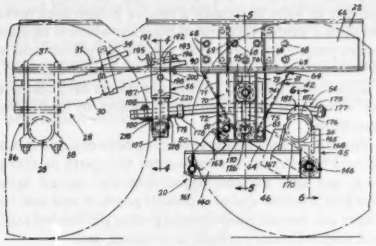


1. In combination, a vehicle having a vehicle structure and supporting wheels therefor, and a retractable load sharing structure connected to the rear end of said vehicle for use in redistributing the load of the vehicle to share the load with the regular supporting wheels therefor, said load sharing structure comprising:
a. a foldable main frame comprising an inner frame part and an outer frame part hinged together, the inner frame part being pivoted to the rear part of said vehicle structure so that it may swing in a vertical plane, said main frame being foldable upwardly to a position adjacent to the rear part of said vehicle and unfoldable to extend rearwardly from said vehicle in a generally horizontal direction;
b. strut means having one end connected to said vehicle structure at a position above the pivot of said inner frame part and connected at its other end to said outer frame part, said strut means including shortening and lengthening means whereby said strut can be shortened to fold said main frame adjacent the rearward part of said vehicle and elongated to extend said main frame in its generally horizontal position;
c. wheel means positioned near the outer end of said outer frame part and in a position below said outer frame part when said foldable main frame is in its extended position;
d. inflatable air bellows means positioned between said wheel means and said outer frame part;
e. strut operating means operable to actuate said strut shortening and elongating means whereby said main frame may be moved into its extended position without at that time placing any portion of the load of said vehicle on said load sharing structure; and
f. means, operable after said foldable main frame and said strut means have been moved into their extended positions, for inflating said bellows means to cause said foldable main frame to move upwardly as a whole relative to said wheel means whereby said load sharing structure may be caused to support at least a part of the load of said vehicle.

3,912,294
VEHICLE SUSPENSION ASSEMBLY

John E. Raidel, Rte. 9 Box 400-M, Springfield, Mo. 65804

Filed June 17, 1974, Ser. No. 480,213
Int. Cl.² B60G 19/02
U.S. Cl. 280—104.5 A 11 Claims

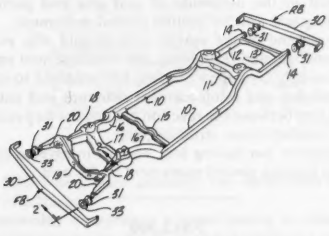


1. A vehicle suspension assembly comprising a hanger assembly attached to and depending from the vehicle chassis, a torque beam, a resilient bushing means mounted to the hanger assembly for pivotally mounted the forward end of the torque beam thereto, means for mounting a vehicle axle to a rearward portion of the torque beam, a bolster beam, means for mounting the rearward end of the bolster beam to the rearward end of the torque beam to maintain a maximum angular position with respect thereto, the bolster beam extending beneath and forward of the hanger assembly, and extensible actuating means connected between the forward end of the bolster beam and the hanger assembly, whereby an extension of the actuating means produces an upward pivotal movement of the torque beam about its pivotal connection at its forward end, a leaf spring means, a bearing means mounted to the hanger assembly above the resilient bushing means at the forward end of the torque beam, said bearing means bearing downwardly on a mid portion of said spring means, and means for applying an upward load on a portion of the leaf spring forward of the bearing means, a portion of the leaf spring rearward of the bearing means bearing downwardly on said axle.

3,912,295
CRASH ENERGY-ATTENUATING MEANS FOR A VEHICLE FRAME CONSTRUCTION

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Mar. 4, 1974, Ser. No. 447,628
Int. Cl.² B62D 27/04
U.S. Cl. 280—106 R 4 Claims

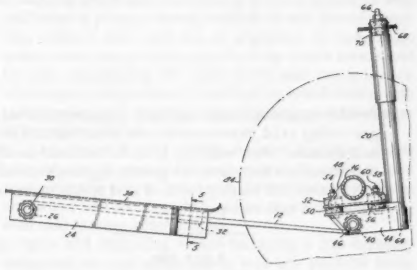


1. Crash energy attenuating means for a frame of a vehicle comprising a one piece elongated tubular beam, said tubular beam being uniformly dimensioned substantially throughout its entire length except for a flared portion disposed at one end, a cross member, means for fixedly securing the unflared end of said tubular beam to said cross member, a bumper secured to the end of said tubular beam having said flared portion, said tubular beam having a mode of collapsing in a direction parallel to the longitudinal axis of said tubular beam when an impact force exceeding a predetermined level is applied thereto from said bumper in a direction substantially parallel to the longitudinal axis of said tubular beam, said flared portion collapsing prior to the remaining portion of said tubular beam to start the collapsing said remaining portion in a direction parallel to the longitudinal axis of said tubular beam.

3,912,296
SHOCK ABSORBER MOUNTING

William D. Allison, Grosse Pointe Farms, Mich., and Donald G. Sippel, Basildon, England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1973, Ser. No. 421,474
Int. Cl.² B60G 11/58
U.S. Cl. 280—124 R 7 Claims



1. A shock absorber mounting comprising:
a telescopic shock absorber strut constructed for use in a motor vehicle,
a first bracket rigidly secured to one end of said strut,
a second bracket constructed to be connected to a vehicle chassis component,
pivot means interconnecting said first and second brackets, said means having a pivot axis arranged generally longitudinal relative to the longitudinal axis of said vehicle,
said second bracket being connected to a wheel support member constructed to support a vehicle wheel,
said pivot axis of said means being disposed in a vertical plane arranged generally perpendicular to the axis of said wheel support member.

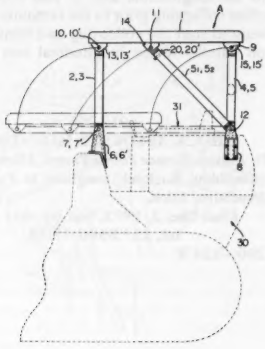
3,912,297
COLLAPSIBLE CANOPY ASSEMBLY

Yoshiji Mitsuishi, Yokohama, and Tomio Uchida, Sagamihara, both of Japan, assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Nov. 19, 1974, Ser. No. 525,234
Claims priority, application Japan, Nov. 24, 1973, 48-134645
Int. Cl.² B62D 25/06
U.S. Cl. 280—150 C 8 Claims

1. A collapsible canopy assembly for protecting an operator's station comprising
a roof,
a normally upright front support means having an upper end thereof pivotally connected to said roof,
a normally upright rear support means spaced longitudinally from said front support means and having an upper end thereof pivotally connected to said roof to form a parallelogram-type linkage with said roof and front support means,
at least one telescopic stay diagonally disposed and pivotally interconnected between said roof and adjacent to a lower

end of one of said front and rear support means, said stay comprising a slide shaft telescopically mounted in a cylinder and spring means interconnected between said slide shaft and said cylinder for normally retracting the same, and



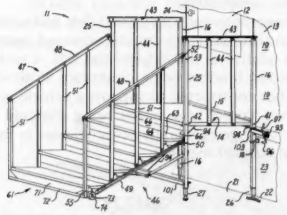
releasable retaining means normally engaging said stay for preventing axial movement of said slide shaft relative to said cylinder when said stay is in its retracted condition and releasable therefrom for permitting extension of said stay against the biasing force of said spring means upon collapse of said canopy.

3,912,298

FOLDABLE STEPS FOR MOBILE HOME

William D. Humphrey, 2473 Sunrise Blvd., Rancho Cordova, Calif. 95670

Filed Jan. 10, 1975, Ser. No. 540,213
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **6 Claims**



1. In combination with a mobile home having a door with a threshold at a predetermined height above ground level, foldable steps comprising:

a. a pair of fixed vertical stanchions adjacent the side edges of the door;

b. a pair of movable stanchions located outwardly from and parallel to said fixed stanchions;

c. a rectangular platform pivotally mounted adjacent its inner corners to said fixed stanchions and pivotally mounted adjacent its outer corners to said movable stanchions, said platform being swingable with said movable stanchions between a first position wherein said platform is substantially horizontal and said movable stanchions are outwardly spaced from said fixed stanchions and a second position in which said platform is inclined forwardly and upwardly and said movable stanchions are in close juxtaposition to said fixed stanchions;

d. a pair of top rails pivotally mounted on said movable stanchions adjacent the upper ends of said movable stanchions, said top rails extending forwardly and downwardly from said movable stanchions;

e. a pair of bottom rails pivotally mounted on said movable stanchions said bottom rails being located below and parallel to said top rails;

f. a plurality of balusters vertically spanning said top rails and said bottom rails and being pivotally mounted thereon to form therewith a pair of balustrades movable between a primary extended position wherein said balustrades project forwardly and downwardly from said movable stanchions into supported relation on the ground and a secondary retracted position in which said balustrades are withdrawn into close juxtaposition to said movable stanchions;

g. a plurality of stair treads extending between and mounted on said balustrades for movement therewith as said platform and said movable stanchions are moved between said first position and said second position and said balustrades are moved between said primary extended position and said secondary retracted position; and

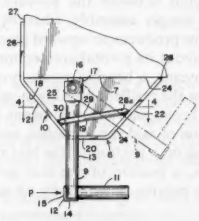
h. winch means for folding said platform, said movable stanchions, said balustrades and said steps.

3,912,299

TRAILER SWING AWAY STEP

George W. Carr, Box 14518, Albuquerque, N. Mex. 87111

Filed June 6, 1974, Ser. No. 476,962
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **20 Claims**



1. In a trailer having a step supporting rear end portion at a side of the trailer, the rear end portion having an underside, a personnel step structure on the trailer comprising:

a pivotal step including an upright arm having an upper end pivotally attached to the underside of said rear end portion,

a step restraining and reinforcement structure fixedly attached to the underside of said rear end portion and guiding said arm for limited pivotal movement,

the lower end of the upright arm of said step extending beyond the step restraining and reinforcement structure, a generally U-shaped reaction bar attached to said step restraining and reinforcement structure and entrapping said arm between the reaction bar and the step restraining and reinforcement structure, and

said reaction bar having fore and aft transverse stop portions limiting pivotal movement of the arm.

3,912,300

ARTICULATED JOINT FOR ARTICULATED VEHICLES

John F. Bryan, Jr., 3212 Mapleleaf Circle, Dallas, Tex. 75233

Filed Aug. 12, 1974, Ser. No. 496,902
Int. Cl.² B60D *1/00*
U.S. Cl. 280—400 **20 Claims**

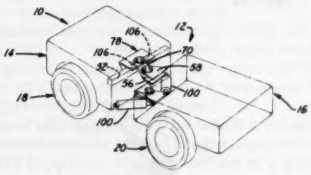
1. An articulated joint for interconnecting forward and rearward units to define an articulated vehicle which comprises:

upper and lower bracket means rigidly mounted on and extending from the adjacent end of one of the units;

vertically aligned upper and lower bearing members secured to the bracket means to define a normally vertical axis of relative pivotal movement between the units with one of said bearing members comprising a spherical bearing member;

bracket means rigidly mounted on and extending from the adjacent end of the other unit and secured to the spherical bearing member;

means connected between the forward and rearward units for selectively pivoting the units relative to each other about the normally vertical axis to effect steering of the articulated vehicle;



arm means secured to the other bearing member and extending substantially horizontally therefrom to the other unit; and

means for connecting the arm means to the other unit with the arm normally oriented substantially horizontally and for accommodating both pivotal movement of the arm means about an axis spaced apart from and normally extending substantially parallel to the normally vertical axis defined by the upper and lower bearing members and oscillation of the arm means relative to the two axes and thereby permitting oscillation between the units about a longitudinal axis extending through the spherical bearing member.

3,912,301

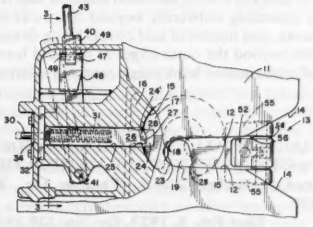
FIFTH WHEEL PLATE ASSEMBLY FOR TRAILER HITCH

Ray L. Ferris, Thornton, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,715

Int. Cl.² B62D *53/12*

U.S. Cl. 280—434 **3 Claims**



1. A fifth wheel plate assembly for connection with the kingpin of a trailer,

said assembly comprising a plate having a substantially circular opening in said plate and an entry slot communicating with said circular opening,

a coupler jaw supported for turning movement within said circular opening,

said coupler jaw including an open end slot normally disposed to be engaged by a kingpin when the kingpin is moving through said entry slot and in alignment with said open end slot in a manner to cause turning movement of said jaw to close said open end slot with the kingpin retained therein,

locking notch means formed on the coupler jaw,

a locking plunger mounted on said plate for lengthwise movement into and out of engagement with said locking notch means when the latter is aligned therewith and the open end slot is in said closed position,

resilient means biasing said locking plunger into engagement with said locking notch means,

the improvement comprising:

locking and actuating means for retracting said locking plunger from seating engagement with said locking notch means including,

an actuating arm connected to said plate and to said locking plunger for manual movement, whereby during said manual movement said locking plunger is in a partially retracted position with respect to said locking notch means against said biasing means,

catch means on said plate for engaging said arm in said partially retracted position,

said locking notch means including means engageable with said locking plunger during rotation of said jaw to a position wherein said slots are in alignment to completely retract said plunger from said locking notch means and thereby disengaging the same from said catch means; whereupon realignment of said locking notch means with said plunger, said biasing means again urges said plunger in engagement therewith;

said catch means having a stop member including disengageable latch and indicating means disposed in one position in the path of horizontal planar movement of said arm when said locking plunger is in seating engagement with said locking notch means,

said latch and indicating means including a flap hingedly supported on said plate and in said one position being disposed vertically indicating a locked position of said plunger,

said flap being manually hingedly movable from said one position to a substantially horizontal position to permit the path of horizontal planar movement of said arm for moving said plunger to said partially retracted position,

said stop member being connected to the underneath side of said plate,

said arm being shiftable vertically into engagement with said stop member during said partially retracted position of said plunger,

said catch means including a ledge supporting said arm during engagement of said plunger with said locking notch means when said plunger is in the partially retracted position, and

means on said locking notch means to completely retract said plunger including first camming means engageable with second camming means on said plunger to move the latter to said completely retracted position whereupon said arm is disengaged from said ledge and drops by gravity from said ledge; and said plunger is biased against said coupler jaw.

3,912,302

SELF-COUPLING HITCH

Ethredge T. Patterson, 18660 Santa Fe, Shafter, Calif. 93263

Filed Sept. 23, 1974, Ser. No. 508,508

Int. Cl.² B60D *1/10*

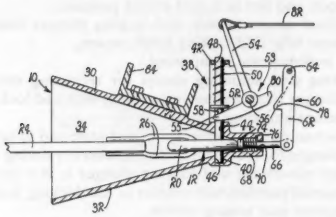
U.S. Cl. 280—477 **8 Claims**

1. An improved self-coupling hitch particularly suited for coupling towable vehicles with towing vehicles comprising:

A. a lug including a center body of a substantially circular configuration adapted to be rididly affixed to the distal end of a connecting link projected from a towable vehicle and characterized by means defining about the periphery thereof an annual bearing surface having an arcuate cross-sectional configuration and an annular bearing seated in the annular bearing surface, and supported

thereby for angular displacement with respect to said center body;

B. an open-end receiver for receiving said lug adapted to be mounted on a towing vehicle; and



C. lug-capturing means mounted in juxtaposition with said receiver for capturing said lug in response to an introduction of the lug into the receiver.

3,912,303

SUSPENSION SYSTEM FOR VEHICLE CAPABLE OF CROSS COUNTRY TRAVEL

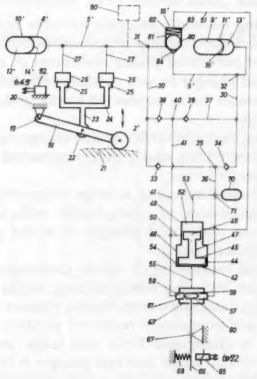
Helmut Thate, and Manfred Wamser, both of Karlsruhe, Germany, assignors to Dr. -Ing. Ludwig Pietzsch, Karlsruhe, Germany

Filed Jan. 28, 1974, Ser. No. 437,343

Claims priority, application Germany, Jan. 31, 1973, 2304728

Int. Cl.² B60G *17/04*, *11/30*

U.S. Cl. 280—124 F **16 Claims**



1. A suspension system for vehicles capable of cross country travel comprising:

a plurality of hydropneumatic spring elements having hydraulic chambers;

a conduit including a coupling conduit serially connecting said elements;

a fluid flow control device in said conduit effective in response to control signals to hydraulically connect the chambers of said spring elements by unlocking said conduit at a predetermined moment of the swinging motion of the spring vehicle body and, after phase displacement of the swinging motion of the hydraulic fluid swinging between these spring elements, to disconnect said elements by locking said conduit, said flow control device comprising a single valve means actuable for locking said conduit by the high pressure and for unlocking said conduit by the low pressure of the fluid pressures in said conduit during operation of the suspension system, whereby said valve is effective to respond to the pressure difference within the system.

3,912,304

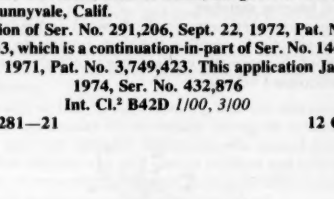
METHOD AND APPARATUS FOR CASING BOOKS AND PRODUCT THEREOF

William H. Abildgaard, Los Altos Hills, and Charles T. Groswith, III, Los Altos, both of Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Division of Ser. No. 291,206, Sept. 22, 1972, Pat. No. 3,825,963, which is a continuation-in-part of Ser. No. 146,648, May 25, 1971, Pat. No. 3,749,423. This application Jan. 14, 1974, Ser. No. 432,876

Int. Cl.² B42D *1/00*, *3/00*

U.S. Cl. 281—21 **12 Claims**



1. A cased book comprising an uncased book having a plurality of sheets, a front end back end leaf on the outside of said sheets and binding means for said sheets and end leaves, and a case for said book having a front and a back and a spine cover, said covers initially being separate from each other, said spine cover comprising a strip of covering material initially discrete from said front and back covers overlapping the spine margins of said front and back covers, the inner edges of said front and back covers being spaced apart with a gap there-between, the overlap or said spine cover being equal on said front and back covers, said covering material having first pressure-sensitive adhesives on its inner face adhering to the portions of said front and back covers overlapped by said covering material to form said case, each of said end leaves having second pressure-sensitive adhesive on its outer surface adhering to the insides of said front and back covers, said second pressure-sensitive material extending to the outer edges of said end leaves, the outer edges of said front and back covers extending outwardly beyond the outer edges of said end leaves, said insides of said covers being devoid of exposed adhesive beyond the outer edges of said end leaves, the spine edge of said uncased book being centered relative to said gap.

3,912,305

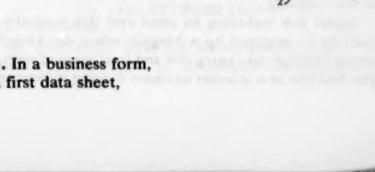
MAGNETICALLY CODEABLE AND SORTABLE PASSENGER TICKET AND METHOD THEREOF

Raymond P. Fischer, 213 S. Wheaton Ave., Wheaton, Ill. 60187

Filed Feb. 5, 1973, Ser. No. 329,388

Int. Cl.² B41L *1/24*

U.S. Cl. 282—23 **1 Claim**

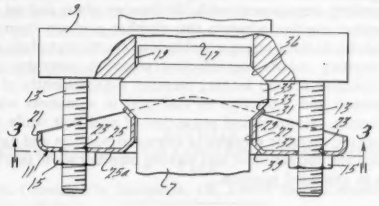


1. In a business form,

a first data sheet,

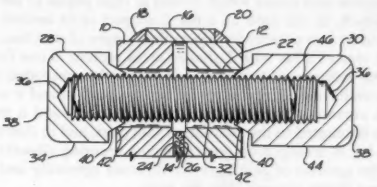
said first data sheet having an upper impression receiving surface and a lower surface,
a second data sheet,
said second data sheet having an upper impression receiving surface and a lower surface, said second data sheet being disposed beneath said first data sheet,
a magnetizable ink carrier sheet located between said first and second data sheets for forming a magnetizable ink character on the upper impression receiving surface of the second data sheet upon impression of a character on the first data sheet,
said magnetizable ink carrier sheet carrying encapsulated and non-encapsulated magnetizable ink on its lower surface only,
said first data sheet, said carrier sheet and said second data sheet being in abutting contact with one another throughout their entire working surface areas,
the encapsulated portion of said magnetizable ink being encapsulated in a viscous or slightly liquid solution in minute gelatinous capsules which are rupturable from the pressure of a character impression instrument on the upper surface of the first data sheet,
the portion of said magnetizable ink which is encapsulated being no more than the amount needed to prevent smudging of the impression receiving surface of a data sheet which is in underlying, abutting contact with the under surface of the carrier sheet which carries said encapsulated and non-encapsulated magnetic ink,
said magnetic ink including about **20%** by weight of iron oxide powder, and
means for securing the sheets into a unitary assembly along one edge portion thereof.

3,912,306
PIPE FLANGE
James McCormick, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.
Filed July 22, 1974, Ser. No. 490,305
Int. Cl.² F16L *23/00*
U.S. Cl. 285—12 **3 Claims**



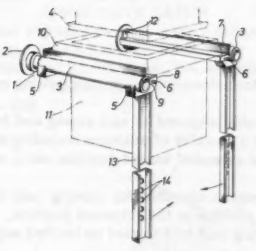
1. In a fluid flow system, such as the exhaust system of an internal combustion engine, for attachment to a housing having a fluid passage therein, such as the exhaust manifold of an internal combustion engine, a pipe for connection to the housing to communicate with the passage, said pipe having an annular flange extending radially outwardly at the end of the pipe to be connected to the housing, a pipe attachment flange comprising a substantially sheet-like member having a flat web and having a collar formed therein to project at right angles to the plane of the web, the interior of said collar defining an opening of circular cross section and uniform diameter and said pipe extending through said opening, said collar and said web intersecting in a substantially conical corner at one end of the collar to provide a first substantially conical surface for engagement with said annular flange, the other end of the collar having a substantially conical flange providing a second substantially conical surface adapted to engage said annular flange, said web having openings therein to receive cylindrical fasteners for attaching the flange to said housing, said first and second conical surfaces having substantially the same cone angle and the same diameter at their small ends whereby the flange may be used with either conical surface facing said housing to thereby provide two different spacings of said web from said housing.

3,912,307
FLANGED JOINT SEALING NUT
Mirrel L. Totman, McPherson, Kans., assignor to Edward L. Brown, Middletown, Ohio, a part interest
Filed May 21, 1973, Ser. No. 362,371
Int. Cl.² F16L *13/14*
U.S. Cl. 285—382 **1 Claim**



1. A bolt hole sealing joint for use on a flanged pipe joint having a pair of abutting metal flange faces with bolt holes therein, comprising:
a threaded stud receivable in the bolt hole;
a rim surrounding the bolt hole;
a metal threaded nut means having a closed outer end, the inner open end having a concentric beveled portion partially receivable in the bolt hole, said beveled portion being harder than the rim of the bolt hole whereby the tightening of the nut causes the rim of the hole to deform against the beveled portion and to conform thereto and thereby create a metal to metal seal therebetween.

3,912,308
LATCHING DEVICE FOR COMPACT FILTER CELLS
Holger Alexis Persson, Enkoping, Sweden, assignor to AB Bahco Ventilation, Sweden
Filed May 17, 1974, Ser. No. 470,920
Claims priority, application Sweden, June 6, 1973, 7307987
Int. Cl.² E05C *3/04*
U.S. Cl. 292—54 **1 Claim**



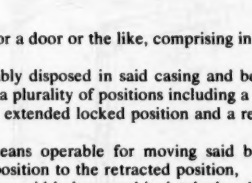
1. A latching device for compact filter sells comprising two parallel, identical latching elements which are mounted for rotation in mirror-image and located at mutually the same height immediately beneath and on opposite sides of an outlet pipe for purified gas in a filter housing for compact filter cells, each of which latching elements comprising a horizontal rotatable pipe which is mounted in the filter housing and which is provided adjacent each of its ends with a projection which in the opened or released position of the latching device extends horizontally towards the opposite pipe and which on the side thereof facing the pipe end has a cylindrical peg which extends parallel with the pipe, and which adjacent at least one end is

provided with a rotatable rod provided with locking means and extending suitably vertically in the open position of the latching device, characterized by a press bar having a planar press surface and extending parallel with said pipe, said press bar, when the latching device is released, being arranged to rest horizontally on the projection and on the pegs associated therewith, and when the latching device is closed is arranged to rest horizontally solely or substantially on the pegs, wherewith each press bar suitably comprises an L-shaped or a Z-shaped bar having a length which slightly exceeds the distance between the pegs on each pipe and which is less than the length of the pipe, and the ends of which bar are provided with rectangular end pieces which extend at right angles to the bar and which, in the case of a bar L-shaped cross section are secured by two adjacent edges at the flanges of said bar, and in the case of a bar with Z-shaped cross section at one flange and the web of said bar, and each of which is provided with a groove having a circular round bottom portion and a width which corresponds to the diameter of the pegs and a depth which is adapted to the position of said pegs; and in that each press bar is arranged on corresponding securing elements so that the grooves of said bars are directed upwardly and the bottoms of the grooves abut the pegs.

3,912,309
LOCK FOR A DOOR OR THE LIKE

Jean Arnold Fischer, and Knud Hansen Fynbo, both of Hjallese, Denmark, assignors to Daempa A/S, Knarreborg, Denmark

Filed Apr. 8, 1974, Ser. No. 458,818
Claims priority, application Denmark, Apr. 13, 1973, 2032/73
Int. Cl.² E05B *55/00*; E05C *1/16*
U.S. Cl. 292—167 **8 Claims**

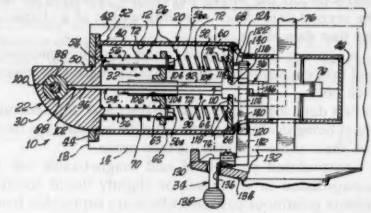


1. A lock for a door or the like, comprising in combination a casing,
- a bolt slidably disposed in said casing and being movable between a plurality of positions including a latched positionn, an extended locked position and a retracted position,
- actuator means operable for moving said bolt from the latched position to the retracted position,
- means urging said bolt toward its latched and locked positions,
- releasable blocking means disposed between said casing and said bolt limiting movement of said bolt relative to said casing to define said latched position, and
- reset means slidably disposed relative to said casing and said bolt for releasing said blocking means whereby said bolt is automatically moved to its locked position,
- said bolt having a beveled end surface inclined between a pair of flat surfaces, one of said flat surfaces projecting out of said casing when said bolt is in its latched position, and both of said flat surfaces projecting out of said casing when said bolt is in its locked position, and
- socket means located in the said one flat surface of said bolt and wherein said releasable blocking means includes a pawl element operatively disposed in said pocket means.

3,912,310
DOOR LOCK

Thomas J. Dugan, 2501 S. El Camino Real No. 206, San Clemente, Calif. 92672

Filed Mar. 22, 1974, Ser. No. 453,585
Int. Cl.² E05C *1/16*
U.S. Cl. 292—169.14 **11 Claims**

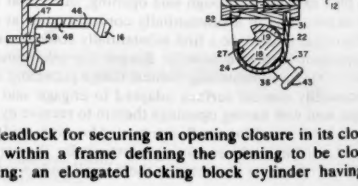


1. A lock for a hinged door comprising:
- a housing,
- a latch bolt having a beveled outer end and movable longitudinally in said housing between an extended position wherein said outer bolt end projects beyond one end of said housing for latching engagement with a keeper plate on the door jamb to latch the door closed and a retracted position wherein said outer bolt end is disposed to clear the keeper plate and release the door for opening,
- spring means urging said bolt to extended position,
- a rotatable handle shaft extending transversely of said housing,
- means connecting said shaft and bolt for retraction of the bolt by shaft rotation, and
- means for selectively releasably locking said bolt in extended position against retraction by a force applied to the outer bolt end comprising a locking member on the outer end of said bolt movable between a retracted position wherein said bolt is freely movable into and from latching engagement with the keeper plate and an extended position wherein the member projects from the bolt for locking engagement behind the keeper plate, and actuating means for effecting selective extension and retraction of said locking member independently of extension and retraction of said bolt in a manner which permits extension and retraction of said bolt while said locking member remains in retracted position and extension and retraction of said locking member while said bolt is in extended position.

3,912,311
DEADLOCK FOR SLIDING DOORS

Bernard J. Carvell, P.O. Box 4092, Foster City, Calif. 94404; W. Nelson Sandford, 5734 Tucson Drive, San Jose, Calif. 95150, and C. Michael Zimmerman, 160 Redland Road, Woodside, Calif. 94062

Filed Feb. 7, 1974, Ser. No. 440,452
Int. Cl.² E05C *3/04*, *3/14*
U.S. Cl. 292—216 **5 Claims**



1. A deadlock for securing an opening closure in its closed position within a frame defining the opening to be closed comprising: an elongated locking block cylinder having a

circular cylindrical outer periphery with an axially extending groove projecting inwardly thereof, which locking block is rotatable on its cylindrical axis for travel of inwardly and longitudinally extending opposed sides of said groove on a circular cylindrical path; a housing having a cavity therein defined by an interior circular cylindrical section surface which coacts and mates with said cylindrical outer periphery of said locking block to define said cylindrical path, said housing having a slot extending into said cavity for passage of a protruding strike end into said cavity for intersection thereby of said cylindrical path and being rigidly mountable adjacent an edge of one of said opening closure and said frame for supporting said block at a location at which when said closure is in its closed position, said cylindrical path of said groove sides of said block is intersected by said strike end protruding from the other end of said closure and said frame whenever said opening closure is moved to its closed position; said opposed sides of said groove being positioned in said block for engagement of a first one thereof by said strike end upon movement of said closure toward its closed position to rotate said block in a first direction and position the second one of said opposed groove sides blocking the return path said strike end follows when said closure is moved toward its open position, and for engagement of said second groove side by said strike end upon movement of said closure toward its open position to rotate said block in a reverse direction and move said second groove side from said blocking location and again position said first groove side in the path of said strike end for engagement thereby when said closure is again moved toward its closed position; and releasable locking means for selectively preventing rotation of said block in said reverse direction moving said second groove side from blocking said return path whereby said closure is maintained by said deadlock in its closed position, said releasable locking means including a pin extending generally radially outward from said locking block through a transverse slot in said housing to the exterior thereof for manipulation and movement along said slot upon said rotation of said locking block, and means on said pin and housing adjacent the periphery of said locking block for preventing movement of said pin from its location in said slot selectively when said second groove side of said locking block is positioned blocking the return path of said strike, whereby said pin and housing are selectively cooperable to prevent rotation of said block in said reverse direction and thereby to lock said closure in its closed position.

3,912,312

LOCKING SYSTEM FOR CONTAINER DOORS AND THE LIKE

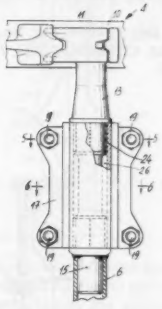
Piero Cerutti, Via Sempione, 18, 21018 Sesto Calende (Varese), Italy

Continuation of Ser. No. 297,682, Oct. 16, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 495,056

Int. Cl.[2] E05C 9/08

U.S. Cl. 292—218 **2 Claims**

1. A door locking system for containers and the like wherein a pivoting door mounted on the frame of the container is adapted to be locked and unlocked relative to the frame by way of an operating rod, and wherein locking stresses are transmitted directly to the door rather than to the operating rod, the system comprising: a pair of spaced supporting bracket means for containing hooking elements on a closure door of the type which is laterally pivoted to a container frame, a pair of movable hooking elements, each pivotably mounted in one of said supporting bracket means, for transmitting locking stresses directly to the container door through its associated supporting bracket means, and for engaging the external surfaces of such supporting bracket means to seal the internal surfaces of the supporting bracket means from the external environment; said hooking elements being arranged to engage with stationary hooking elements of the type mounted on a container frame surrounding a container door; each said movable hooking element comprising a hook for selectively engaging and disengaging an associated stationary hooking element, and a leg joined with said hook, a first collar defined on said leg, an intermediate cylindrical portion joined on one end to said first collar, a second collar defined at the other end of the intermediate cylindrical portion, said intermediate cylindrical portion defining a pair of end sections and an intermediate section with a flange located between each end section and said intermediate section, and a bottom section joined at one end to said second collar with its other end free, the intermediate cylindrical portion of said leg of said movable hooking element being received within said supporting bracket means with said first and second collars in sealing



engagement with the end external surfaces of said supporting bracket means, a bushing mounted on each end section of said intermediate cylindrical portion extending between said collar and said flange associated therewith and contacting the inner surface of said supporting bracket means to facilitate the pivotal action of said movable hooking element and to transmit locking stresses from said movable hooking element to said supporting bracket means, and a tubular operating rod receiving the free end of said bottom sections and fixedly interconnected with the second collars so that rotation of said movable hooking elements can be readily effected by said operating rod in a manner that locking stresses are isolated therefrom.

3,912,313

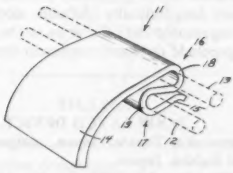
CAGE GATE LATCH

Walter Michael Pigorsh, Pierson, Mich., assignor to Kitson Poultry Equipment Co., Morley, Mich.

Filed Apr. 22, 1974, Ser. No. 462,600

Int. Cl. B65d 45/30

U.S. Cl. 292—258 **2 Claims**



1. A gate latch for securing a pair of wires in a fixed parallel spaced-apart register with each other, the combination comprising:

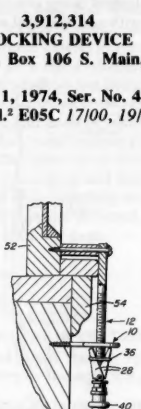
a unitary flat spring element having a body portion of serpentine S configuration so as to define a first loop portion and an oppositely opening second loop portion spaced laterally from said first loop portion, said second loop portion having a terminal end actuating handle portion extending therefrom, said body portion further defining

narrow openings to said loop portions which are adapted to make snap engagement with parallel registering wire elements, said loop portions being in close abutting relationship so that rotation of said spring element around a first wire element positioned in said first loop portion causes the said second loop portion to make overcenter locking snap engagement with a second wire element in close parallel spaced-apart register with said first wire element.

3,912,314
LOCKING DEVICE

Hewitt A. Sompayrac, Box 106 S. Main, Society Hill, S.C. 29593

Filed July 1, 1974, Ser. No. 484,672
Int. Cl.² E05C *17/00, 19/00*
U.S. Cl. 292—285 **6 Claims**



1. A locking device for releasably securing adjoining units against outward movement relative to each other said device including a keeper element and a bolt element mountable on the respective units: said keeper element having aperture therethrough for the selective reception of the bolt element; said bolt element comprising an elongated shaft; said shaft having a first mounting end for affixing of the bolt element to one of the units; and a second leading end for selective introduction into and through the keeper mounted on the second unit; securing means mounted on said shaft inward of the leading end; said securing means being selectively moveable between a first collapsed position adjacent the shaft for passage through the keeper and a second expanded position projecting outwardly from said shaft sufficiently to preclude passage through the keeper; said securing means having multiple arms, each arm having one end pivotally mounted to the shaft and being movable between a first inwardly pivoted position defining the collapsed position and a second outwardly pivoted position defining the expanded position; means biasing said arms to the outwardly pivoted position; and retaining means longitudinally shiftable along said shaft and selectively engageable over the arms in the inwardly pivoted position to preclude outward movement thereof.

3,912,315
DOOR LATCH DEVICE

Minoru Yamanaka, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 13, 1973, Ser. No. 424,325
Claims priority, application Japan, Dec. 13, 1972, 47-124972; Dec. 13, 1972, 47-124973; Dec. 30, 1972, 47-2297; Mar. 31, 1973, 48-37049; Apr. 25, 1973, 48-47394
Int. Cl.² E05C *1/12*
U.S. Cl. 292—335 **16 Claims**

1. A door latch device for cooperative use with a striker, comprising:

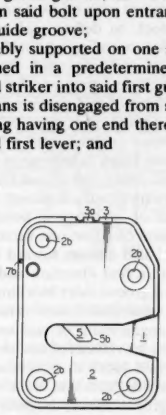
A frame having a first guide groove adapted to receive said striker, a second guide groove extending normally to and communicating with said first guide groove, and a third guide groove aligned with said second guide groove across said first guide groove;

a bolt slidable along and through said second and third guide grooves;

detent means normally engaging said bolt to hold the same in said second guide groove, said detent means being disengaged from said bolt upon entrance of said striker into said first guide groove;

a first lever turnably supported on one side of said frame and being turned in a predetermined direction upon entrance of said striker into said first guide groove before said detent means is disengaged from said bolt;

an extension spring having one end thereof coupled to the free end of said first lever; and



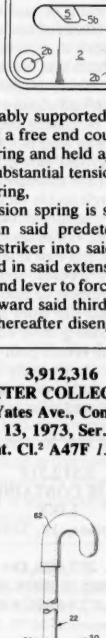
a second lever turnably supported on said one side of said frame and having a free end coupled to the other end of said extension spring and held against said bolt in such a manner that no substantial tension is normally exerted on said extension spring,

whereby said extension spring is stretched when said first lever is turned in said predetermined direction upon entrance of said striker into said first guide groove, the energy thus stored in said extension spring being utilized to cause said second lever to force said bolt to slide in said second groove toward said third guide groove when said detent means is thereafter disengaged from said bolt.

3,912,316
LITTER COLLECTOR

Robert D. Veech, 11 Yates Ave., Commack, N.Y. 11725

Filed Sept. 13, 1973, Ser. No. 396,684
Int. Cl.² A47F *13/06*
U.S. Cl. 294—19 R **11 Claims**



1. A litter collector comprising a main frame, including a pair of jaws comprising means to hold the jaws normally in a closed position and means to releasably hold the jaws in open

position: in combination with a receptacle comprising a main body portion of a deformable material comprising an opening; wherein the receptacle body portion is held between said jaws with at least a portion of said receptacle body portion adjacent said opening being folded over the outside of at least one jaw; said combination comprising means to selectively secure the receptacle to the main frame and closure means for the receptacle opening; said receptacle comprising an opening being in the form of a bag, or envelope having a closed end and an open end, with said open end folded over said jaws by cuffing at least a portion of said open end over said jaws; thereby forming a second, intermediate opening positioned between said cuffed portion of the bag and said closed end of the bag, at least when the jaws are in open position; said bag being provided with closure means for the first mentioned opening in said open end; in which the jaws comprise a pivot connection and the means to hold the jaws in normally closed position comprises a spring, and the means to releasably hold the jaws in open position comprises a latch pivoted to one of the jaws for movement from a first or open position to a second or closed position.

3,912,317

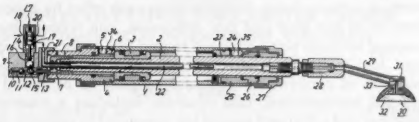
VACUUM SUCTION TYPE MANIPULATOR

Makoto Ohnaka, Yokohama, Japan, assignor to Shiroyama Kogyo Kabushiki Kaisha, Japan

Filed July 10, 1974, Ser. No. 487,064

Int. Cl. B66c *1/02*

U.S. Cl. 294—64 R **10 Claims**



1. A vacuum suction type manipulator comprising an elongated cylinder, a piston operable in said cylinder, said piston having a tube means affixed thereto and being slidable between extended and retracted positions, a suction device mounted on the end of said tube means, said tube means conducting operating air to said suction device, a valve mounted on said cylinder for introducing air into said tube means, and operable means for controlling said valve such that the valve is closed when said tube means is in substantially its retracted position and is open as said tube means is extended, whereby operating air passes through said tube means to operate said suction device for substantially all extended positions of the tube means.

3,912,318

SELF-CLOSING LIFT HOOK

Duncan C. Engh, Red Wing, Minn., assignor to D. B. Enterprises, Inc., Red Wing, Minn.

Filed June 27, 1974, Ser. No. 483,702

Int. Cl.² B66C *1/36*

U.S. Cl. 294—82 R **10 Claims**

1. A load lift hook device comprising:

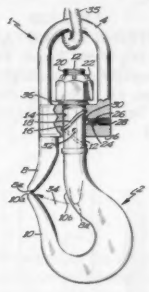
a lift cable engaging lift eye having a base wall;

an aperture extending through said base wall of said eye, said aperture having a positioning thread formed thereon and being oriented vertically when said eye is in its normal upright position of use with said base wall extending horizontally;

a hook having an elongated shank extending through said aperture into said lift eye, said shank having an external positioning thread thereon mating and engaged with said positioning thread in said aperture, said aperture and shank positioning threads being so constructed and formed that said eye moves downwardly on said hook shank and said shank thereby moves upwardly into said eye as said eye is rotated relative to said hook shank in a predetermined opening direction;

an upwardly projecting tip on said hook spaced from an opposite, stem portion of the hook and defining therewith a throat opening on said hook; and

latch means on said base wall of said lift eye cooperating with said hook tip in a closed position of said eye and hook to bridge the gap across said throat opening to close said hook, said latch means being rotatable with said eye



to an open position of displacement away from said hook tip as said eye is rotated relative to said hook shank in said opening direction, whereby the application of a downward load force on said hook will cause said hook shank to move downwardly relative to said eye to thereby rotate said eye relative to said hook shank on said hook shank positioning thread in a closing direction opposite to said opening direction so as to automatically rotate said latch means to said closed position as said eye moves upwardly relative to said hook shank.

3,912,319

APPARATUS FOR RAISING FLOATING BODIES

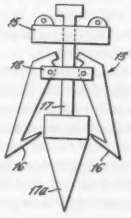
George Adam Hamilton, Gourock, England, assignor to Speedcranes Limited, Gourock, Great Britain

Filed Sept. 11, 1972, Ser. No. 287,746

Claims priority, application United Kingdom, Sept. 13, 1971, 42555/71

Int. Cl.² B63B *27/04*

U.S. Cl. 294—83 R **13 Claims**



9. The combination comprising:

a body adapted to be lifted and lowered, said body having substantially horizontal grid means mounted thereon, said grid means including grid members defining a plurality of interstices; and

a grappling device adapted to be releasably attached to said grid means for permitting lifting or lowering of said body, said grappling device having jaw means for automatically engaging said grid members when said device is moved into engagement with said grid means, and release means coacting with said jaw means to permit release thereof from said grid members, wherein said device includes a

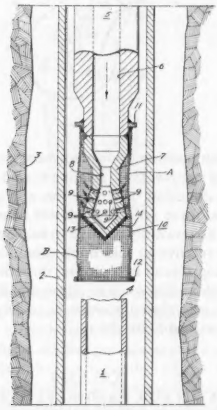
locating member having a locating head mounted on the lower end thereof, said locating head being adapted to slidably enter and extend through one of said interstices when said device is moved into engagement with said grid means, said jaw means including at least one hook member pivotally mounted on said locating member and positioned for engaging one of said grid members when the locating head enters said one interstice.

3,912,320

DRILL STRING RETRIEVAL DEVICE

Bernard J. Keenan, Jr., West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 11, 1974, Ser. No. 505,124
Int. Cl.² E21B *31/02*
U.S. Cl. 294—86.15 **9 Claims**



1. A device for withdrawing an elongated member from a well comprising

a. a cylindrical member, having an internal passageway, the lower end of said member being introduced into the well,

b. a capping member, fixedly mounted to the lower end of said cylindrical member, having an upper section and a lower section adapted to fit into the elongated member forming a seal therewith,

c. a series of ports in the upper section of said capping member through which the fluid passageway of said cylindrical member is in internal communication with the well outside of said capping member,

d. a cylindrical mesh of metal wires, cables or strands, of a diameter essentially greater than that of the elongated member, attached at one end to the cylindrical member and extending vertically downward to surround the capping member and an upper portion of the elongated member, said mesh woven so that a radial expansion in one section results in radial constriction in another section,

e. means for lowering the device into the borehole so that said capping member meets and forms a seal with the elongated member,

f. means for pumping drilling mud or the like through the cylindrical member and outwardly through said ports thereby radially expanding the cylindrical mesh in one section, resulting in radial constriction in the section surrounding the elongated member to be removed resulting in gripping of said elongated member and

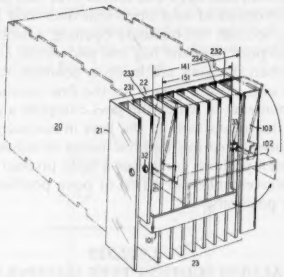
g. means for withdrawing the device and thereby withdrawing the elongated member attached thereto.

3,912,321

EQUIPMENT HANDLE WITH POSITIVE LOCKING ATTACHMENT TO FINNED SURFACES

David Howard Williamson, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 10, 1974, Ser. No. 459,451
Int. Cl.² B25G *1/02*
U.S. Cl. 294—27 H **4 Claims**



1. A handle to connect to a structure having vertical surfaces wherein said structure includes a first pair of vertical surfaces being displaced from each other by a first dimension and including means to accept attachments, a second pair of vertical surfaces being displaced from each other by a second dimension less than said first dimension, said second pair of vertical surfaces being adjacent to said first vertical surfaces, said handle having a structure shaped from a continuous medium of resilient material and adapted to be flexed by manual manipulation, said structure including a transverse member and a first and second leg connected to opposite ends of said transverse member, first and second attachment means connected to said first and second legs to permit coupling to said means to accept attachments by flexing said handle, said first and second attachment means and said means to accept permitting rotation of said handle about an axis common to said first and second attachment means, means to lock said first and second attachment means into said means to accept attachment, said means to lock comprising means to abut upon said second pair of vertical surfaces adjacent to the first pair of vertical surfaces including said means to accept and prevent flexing of the structure of said handle, said means to abut being offset from said axis so that said handle may be rotated to a position at which said means to abut no longer abuts on said second pair of vertical surfaces adjacent to the first pair of vertical surfaces whereby the said structure may be flexed to permit coupling of said first and second attachment means to said means to accept.

3,912,322

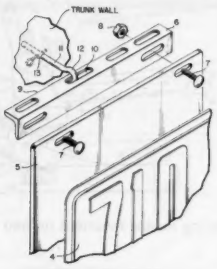
ANTI-THEFT FUEL INLET COVER

Jeffrey L. Weaver, Des Plaines, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 19, 1974, Ser. No. 490,068
Int. Cl.² B60J *9/02*
U.S. Cl. 296—1 C **2 Claims**

1. In combination, a vehicle having a body defining a passenger compartment and a luggage compartment, a cover for said luggage compartment pivotably connected to said body to permit access to said luggage compartment, a fuel storage container secured to and positioned beneath said body in proximity to said luggage compartment, a fuel inlet tube connecting said fuel storage container to a fuel inlet positioned in an exterior wall of said body adjacent to said cover, a cover for said fuel inlet tube, a shield member, a support member for said shield member pivotably secured to said exterior wall for covering said fuel inlet cover, said support member being pivotable away from said exterior wall to expose said fuel inlet

cover, a slotted bracket member secured to said support member, a rod-like member extending through said exterior wall into said luggage compartment, said rod-like member having a curved end portion external to the wall which is adapted to fit into a slot in the bracket, said rod-like member having a



shank portion which extends within said luggage compartment, said shank portion having an aperture therein, and a removable pin extending through said aperture for securing said rod member in place to prevent rotation of said shield member until the cover is opened and said pin removed from said aperture.

3,912,323

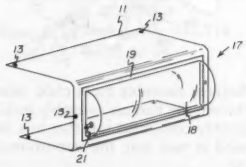
PROTECTIVE COVER FOR CABOVER CAMPER

Robert R. Dancik, 7753 Navajo, Denver, Colo. 80221

Continuation-in-part of Ser. No. 367,110, June 5, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 413,104

Int. Cl.² B60P *3/32*

U.S. Cl. 296—23 MC **4 Claims**



1. A cover for at least the leading surface of the overhang of a cabover camper, comprising: a rectangular pliant sheet of material, a window portion of transparent material defined in the pliant sheet of material, releasable fastening means located adjacent the periphery of the pliant sheet of material for removably attaching the cover over the leading surface of the overhang of a cabover camper, a second transparent sheet of pliant material hermetically sealed over at least a portion of the area of the pliant sheet of material and covering the window portion thereof, and inflation means for facilitating the flow of a pneumatic fluid into the volume defined by the hermetically-sealed second sheet and the cover, whereby a pneumatically-supported surface is provided to cushion debris impacting thereon and thus minimize encrustment of such debris, and to function as a self-cleaning surface by vibration.

3,912,324

SWING-OUT TABLE FOR RECREATIONAL VEHICLES

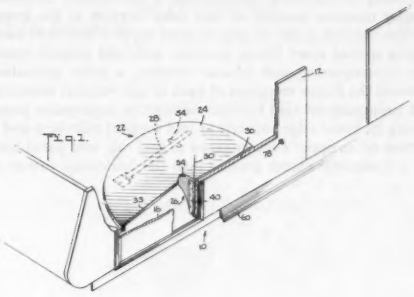
Harley D. Troyer, Goshen, Ind., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed July 2, 1973, Ser. No. 375,398

Int. Cl.² B60P *3/32*

U.S. Cl. 296—23 R **8 Claims**

1. In a recreational vehicle having a side wall with an opening therethrough, a table assembly including a table, means for pivotally mounting the table to the vehicle for movement through the side wall opening between first and second locations on respective opposite sides of the side wall, a table leg carried for pivotal movement about two axes respectively



generally parallel and normal to the table along its underside for movement between a stored position and a table supporting position, and means carried by the side wall of said vehicle for engaging and supporting the table leg in its table supporting position.

3,912,325

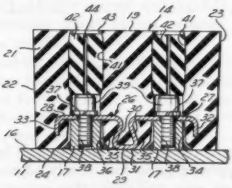
TRUCK BED LINER AND DOCK BUMPER COMBINATION

John R. Sudyk, Middlefield, Ohio, assignor to The Johnson Rubber Company, Chagrin Falls, Ohio

Filed Oct. 31, 1974, Ser. No. 519,504

Int. Cl.² B62D *33/00*

U.S. Cl. 296—39 R **6 Claims**



1. A liner structure comprising a support surface, a plurality of substantially parallel and spaced mounting bars secured to said surface, a plurality of elongated liner members secured to said mounting bars, each liner member including an elongated body of tough elastomeric material and an elongated mounting plate embedded in and bonded to said elastomeric material, said body being formed with a lengthwise channel fitting over and mating with an associated bar, and a plurality of fasteners spaced along said body securing said plate to the associated bar and securing said liner member to said surface, said plate being provided with depending skirt portions on either side of said channel interlocking said plate and said elastomeric material on both sides of said channel.

3,912,326

TAIL GATE

Richard L. Tass, 45 N. Main St., Buffalo, Wyo. 82831

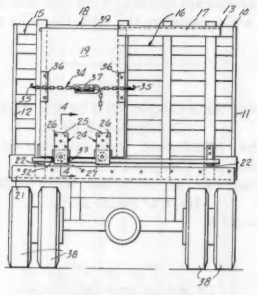
Filed Apr. 15, 1974, Ser. No. 461,240

Int. Cl.² B62D *25/00*

U.S. Cl. 296—51 **1 Claim**

1. In a tail gate for an animal carrying vehicle, a body including a pair of spaced parallel vertically disposed sides extending upwardly in said body, a back portion extending vertically upwardly in said body at the rear thereof and includ-

ing a pair of spaced apart sections with the first of said sections substantially shorter in a horizontal direction than the second of said sections with said sections defining an offset opening therebetween, an inverted U-shaped generally horizontal rail rigidly secured to the top portion of said second section and extending substantially thereacross, a horizontally disposed tubular member secured to said back portion at the lower portion thereof, a pair of spaced apart support members each having spaced apart flange portions with said support members encompassing said tubular member, a roller journalled between the flange members of each of said support members and supported on said tubular member, a rectangular panel having its lower edge secured to said support members and a portion of its upper edge engaged in said rail, said panel having a horizontal extent greater than the horizontal extent of



said opening, a pair of spaced bores in said tubular member arranged on opposite sides and closely adjacent one of said support members, stop pins removably mounted in said bores for preventing substantial horizontal movement of said panel, said panel on removal of one of said pins being movable horizontally from a position to the rear of and covering said opening to a position to the rear of said second section uncovering said opening, said panel on removal of the other of said pins being movable horizontally in a direction toward said first section to disengage the upper edge of said panel from said rail to permit said panel to hinge downwardly and rearwardly about the axis of said tubular member to form a loading ramp for said body, and a locking chain releasably secured at opposite ends to said first and second sections intermediate the upper and lower portions thereof to secure said panel in a position covering said opening.

3,912,327

ROCKER RECLINING HARDWARE

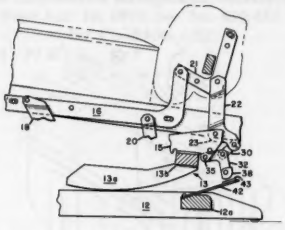
Warren F. Johnson, Northville, N.Y., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,692

Int. Cl.² A47C *3/02*

U.S. Cl. 297—272 **5 Claims**

1. A blocking mechanism to block reclining movement in a reclining chair including a first means carried on a rockable portion of said chair and second means carried on a base portion of said chair, wherein the means carried on the base



portion is a spring means mounted on and wholly supported by said base.

3,912,328

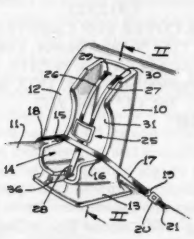
ABDOMINAL RESTRAINT AND BELT STORAGE MEANS FOR CHILD SAFETY SEATS FOR VEHICLES

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed May 22, 1974, Ser. No. 472,079

Int. Cl.² A62B *35/00*

U.S. Cl. 297—389 **6 Claims**



1. In a harness assembly for a child safety seat for use in vehicles wherein the harness assembly includes at least three straps adjustably connected together in a location in front of a child seated in said seat, the improvement comprising the provision of:

an anchor member and means thereon for anchoring and adjusting the length of the free ends of said straps to said member to operably connect said straps in relative length adjustable anchored relation; and

housing means for enclosing said anchor member, anchoring means and strap ends to render the same inaccessible to a child passenger seated in said child safety seat.

3,912,329

SEAT BELT ASSEMBLY

David G. Connors, Plymouth, and Harkrishan Singh, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 1, 1974, Ser. No. 484,898

Int. Cl.² A47C *31/00;* **A44C** *5/18;* **A44B** *11/25*

U.S. Cl. 297—389 **1 Claim**

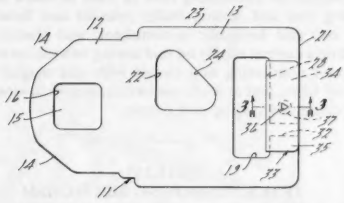
1. A seat belt assembly comprising:

an elongated tongue plate having a buckle latch engaging portion and a webbing receiving portion,

the webbing receiving portion having a main slot means extending laterally of the tongue plate through which ends of a lap belt and a shoulder harness webbing are threaded,

each webbing end being folded against and stitched to its webbing into a permanent loop coupling the webbing to the tongue plate,

wherein the improvement comprises:
an auxiliary slot extending from an edge of the tongue plate into the main slot means,
the auxiliary slot providing a passageway through which the webbing loop may be passed for disassembly of the webbing from the tongue plate without destroying the integrity of the stitching forming the webbing loop,



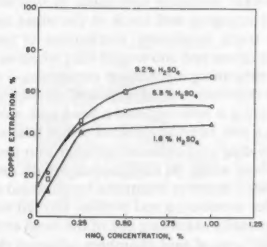
and a displaceable spring clip means affixed to the tongue plate blocks disassembly passage of the loop through the auxiliary slot,
the spring clip means extending between the slot means and the tongue plate edge and having a part overlying the auxiliary slot means,
the spring clip means and the tongue plate between the slot means and plate edge having interlocking retention means locking the clip means to the plate.

3,912,330

CHEMICAL MINING OF COPPER PORPHYRY ORES

Thomas G. Carnahan, Sparks, and Harold J. Heinen, Reno, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 4, 1974, Ser. No. 447,716
Int. Cl.² E21B *43/28*
U.S. Cl. 299—4 **10 Claims**



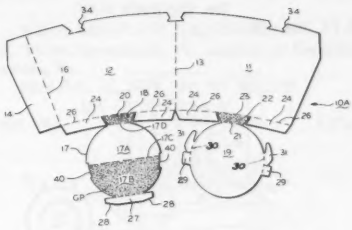
1. A process for extracting copper from a buried porphyry ore body containing chalcopyrite which comprises:
fracturing a zone within said ore body;
contacting ore in said fractured zone with a leach solution comprising an aqueous mixture of sulfuric acid and a catalytically effective amount of nitrate ion in the presence of free oxygen at a temperature within the range of 60° to 150°C for a time sufficient to dissolve chalcopyrite contained in said ore;
separating copper-containing leach solution from the ore, and
recovering copper from the leach solution.

3,912,331

FOLDING TUB WITH AUTOMATIC BOTTOM

William E. Turner, Stone Mountain, and Gary L. Gray, Doraville, both of Ga., assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 11, 1974, Ser. No. 460,092
Int. Cl.² B65D *5/36*
U.S. Cl. 229—41 B **1 Claim**



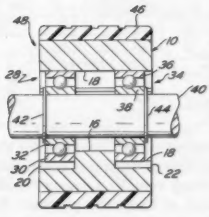
1. A cut and scored unitary paperboard blank for forming a tub adapted to be shipped in a collapsed condition, said blank comprising:
a. first and second major panels joined along a fold line;
b. a glue flap foldably connected to one or said panels along another fold line;
c. flanges foldably connected to the bottom edges of said panels and foldable thereagainst for stiffening said panels;
d. a first substantially circular panel foldably attached to the lower edge of one of said major panels for forming an inner bottom panel of a tub when the same is erected;
e. a second substantially circular panel foldably attached to the lower edge of the other of said major panels for forming an outer bottom panel of said tub;
f. said second circular panel having a fold line extending substantially medially thereof and dividing said panel into two substantially equal halves adapted to be folded against one another;
g. said first and second circular panels each having a pair of foldable ears hingedly attached thereto along the edges thereof and foldable into position between said flanges and said bottom edge of said major panels when said blank is erected into a tub.

3,912,332

WHEEL

Vercoe C. Jones, Easton, Pa., assignor to Si Handling Systems, Inc., Easton, Pa.

Filed June 28, 1974, Ser. No. 484,206
Int. Cl.² B60B *27/00*
U.S. Cl. 301—5.7 **7 Claims**



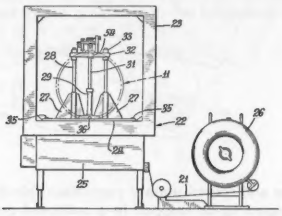
1. A wheel comprising an annular hub having a plurality of radially inwardly projecting ribs, the axial length of said ribs being less than the axial thickness of said hub, two sets of bearings in said hub, each rib being between said bearing sets,

each rib being a limit stop for said bearing sets, the I.D. of said hub being provided with a recess aligned with each end of each rib, and each recess extending to the side face of the hub.

3,912,333
WHEEL RIM STRIP ASSEMBLY

Eugene Von Heitlinger, Chicago, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Division of Ser. No. 439,383, Feb. 4, 1974, Pat. No. 3,840,956.
This application May 20, 1974, Ser. No. 471,679
Int. Cl.² B60B *21/00*
U.S. Cl. 301—98 **4 Claims**

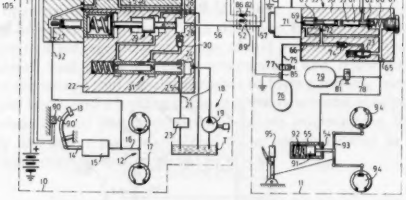


1. In a wheel having a hub, a rim with a plurality of spoke apertures and a valve stem hole extending radially therethrough, spokes connected at their inner ends to said hub, and nipples extending through said spoke apertures and connected, respectively, to the outer ends of said spokes; a nylon strip wrapped around the periphery of said rim in contact with the outer ends of said nipples to protect a tire subsequently mounted on said rim against puncture by any accidentally loosened said nipple, said strip having an aperture cut therethrough coinciding with said valve stem hole.

3,912,334
HYDRAULIC BRAKING ARRANGEMENT FOR TOWING VEHICLE WITH TRAILER

Gunter Schwerin, Moglingen, and Werner Reitz, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 23, 1975, Ser. No. 543,333
Claims priority, application Germany, Jan. 31, 1974, 2404519
Int. Cl.² B60T *13/00*
U.S. Cl. 303—7 **23 Claims**

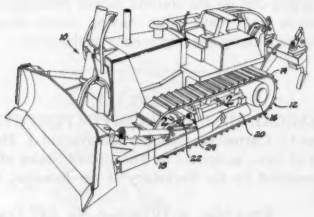


1. Hydraulic braking arrangement for a towing vehicle with a trailer comprising an operator controlled main brake cylinder on the towing vehicle; a second brake cylinder on said trailer; a source of hydraulic pressure fluid on said towing vehicle; conduit means connecting said source with said second brake cylinder; a brake valve on said towing vehicle arranged in said conduit means and constructed so that the fluid pressure exerted on said second brake cylinder is influenced in dependence on the pressure exerted by the operator on said main brake cylinder; a fluid coupling in said conduit means dividing the latter in a first section connected to the towing vehicle and a second section connected to said trailer; a hydraulic accumulator on said trailer; fluid passage means connecting said hydraulic accumulator with said second section of said conduit means; a one-way valve in said passage means permitting flow of fluid from said second section into said hydraulic accumulator while preventing flow of fluid in the opposite direction; a solenoid valve in said passage means including a magnet and a control member cooperating with said magnet for controlling flow of fluid between said fluid coupling and said second brake cylinder and between the latter and said hydraulic accumulator; and electric circuit including a current supply on said towing vehicle; an electrical connector connecting said circuit with said magnet of said solenoid valve; and at least one switch on said towing vehicle for opening and closing said circuit.

3,912,335
TRACK TENSIONING MECHANISM

George A. Fisher, Mentor, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1974, Ser. No. 522,480
Int. Cl.² B62D *55/00*
U.S. Cl. 305—10 **3 Claims**

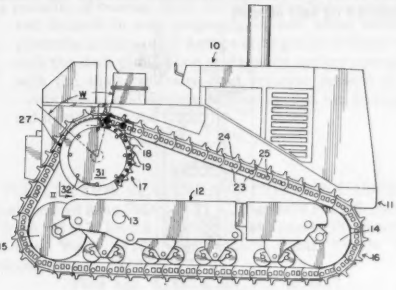


1. In a tracked vehicle, a track frame, an endless track, a driven sprocket engaging said track at one end thereof, an idler wheel engaging said track at the other end thereof, an adjustable track tensioning mechanism connected to said track frame at one end and to said idler wheel at the other end, said track tensioning mechanism comprising a cylinder member and a relatively movable piston member, said cylinder member having a base end and a head end, said piston member having a pair of axially spaced piston heads formed therewith for dividing said cylinder member into two variable volume chambers along its longitudinal length and for assuring that said piston member maintains longitudinal alignment with said cylinder member, a rod portion formed with said piston member normally extending out of the head end of said cylinder member, one of said chambers adjacent the base end of said cylinder member having a compressible fluid at a predetermined pressure so as to cushion track shocks, said rod portion having an elongated dead end bore formed therein along the longitudinal axis of said piston member, a plunger slidably received within said bore and forming a closed variable volume chamber therewith, an incompressible fluid located in said closed variable volume chamber in said rod portion, valve means carried by said plunger and adapted to direct an incompressible fluid under pressure into said closed variable volume chamber in the rod portion so as to cause said plunger to move outwardly relatively to said rod portion so as to adjust the tension of said endless track while maintaining the compressible fluid in said cylinder member at said predetermined pressure.

3,912,336
PROTECTIVE SHROUD FOR THE DRIVE SPROCKET OF A TRACK-TYPE VEHICLE

Arthur J. Ritter, Jr., Metamora, and David L. Perry, Peoria, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Aug. 2, 1974, Ser. No. 494,025
Int. Cl.² B62D *55/20*
U.S. Cl. 305—12 **12 Claims**

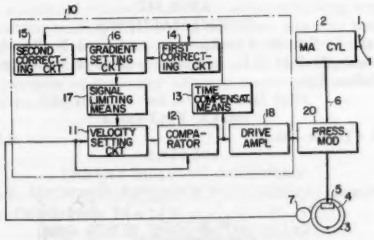


1. In a track-type vehicle having an endless track assembly engaged by a rotatable drive sprocket at a common wrap angle thereof, the improvement comprising annular shroud means secured to said drive sprocket for continuously masking an outboard side of said engagement throughout a circumferential length of said wrap angle, said shroud means comprising a cantilevered mask portion extending radially outwardly to terminate at least approximately at the outer periphery of said drive sprocket and closely adjacent thereto.

3,912,337
ANTISKID APPARATUS

Takeshi Ochiai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1972, Ser. No. 268,076
Claims priority, application Japan, July 6, 1971, 46-49311
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 P **32 Claims**

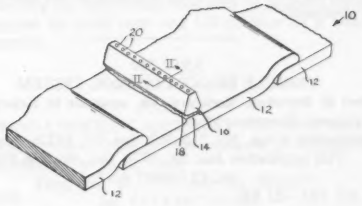


1. A skid control system for a vehicle having a wheel and a brake system for slowing the vehicle, comprising wheel velocity detecting means coupled to the wheel, control means responsive to said detecting means for initiating a signal when said detecting means indicates that the wheel velocity decreases faster than a given rate of velocity decrease and for maintaining the signal while the wheel velocity is less than the velocity corresponding to the given rate of decrease, brake modulating means coupled to said control means for reducing the braking effect of the system on the wheel in response to the signal and cancelling the reduction of the braking effectiveness in the absence of the signal, variable gradient establishing means coupled to said control means for continuously only steepening the given rate of decrease over a time period toward a maximum rate of decrease in response to the absence of the signal and for continuously lessening the given rate of decrease over a time period during the signal, time delay means coupled to said gradient establishing means for delaying the lessening of the given rate of decrease and continuing the steepening of the given rate of decrease for a given time after onset of the signal.

3,912,338
WEAR RESISTANT GROUSER BAR

Leonard E. Toews, Greensburg, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Feb. 21, 1974, Ser. No. 444,378
Int. Cl.² B62D *55/08*
U.S. Cl. 305—54 **6 Claims**

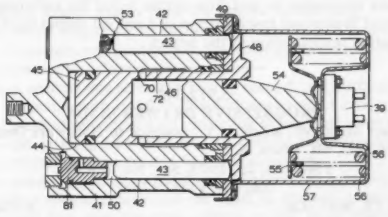


1. An endless metallic track and a grouser bar element welded to the endless metallic track so as to protrude outwardly therefrom comprising; a steel body positioned transversely on the endless metallic track and protruding outwardly therefrom toward the side of the metallic track which engages the ground, said body on the one edge which faces the metallic track welded to the track, said body on the other edge which faces outwardly from the metallic track being provided with recess means of substantial depth, and insert means of a hard wear resistant material fixedly mounted in said recess means, said insert means substantially filling said recess means and having a minor portion only of the length thereof protruding outwardly from the said other edge of the said body.

3,912,339
MODULATOR ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

David Anthony Harries, Monkspath, England, assignor to Girling Limited, Birmingham, England

Filed May 22, 1973, Ser. No. 362,797
Claims priority, application United Kingdom, June 6, 1972, 26229/72; July 6, 1972, 31609/72
Int. Cl.² B60T *8/06*
U.S. Cl. 303—21 F **12 Claims**



1. A modulator assembly for use in a hydraulic anti-skid braking system of a vehicle incorporating at least one fluid circuit connected to a wheel brake, said modulator assembly comprising a body including a chamber adapted to be con-

nected in said fluid circuit, a first piston working in a first cylinder bore in communication with said chamber and movable between an advanced position in which the volume of said chamber is at a minimum value and a retracted position, a second piston working in a second cylinder bore and acting on said first piston through an abutment, a first area of said second piston which is adapted to be subjected to hydraulic fluid under pressure to normally urge said first piston into the advanced position, and a second area of said second piston which is opposed to said first area and which is adapted to be subjected to hydraulic fluid under pressure in order to allow said first piston to move into the retracted position when the decleration of the braked wheel exceeds a predetermined value, said first and second pistons being arranged side-by-side in overlapping relationship with the said second area of said second piston being spaced from said abutment in a direction corresponding to that in which said first piston extends from said abutment, with said first piston and said second area of said second piston both being disposed on the same side of said abutment.

3,912,340

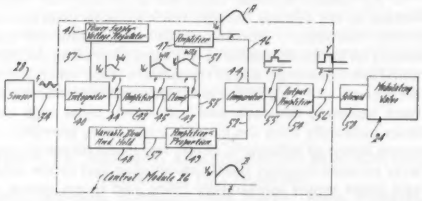
VEHICLE BRAKE CONTROL SYSTEM

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 218,362, Jan. 17, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 436,938

Int. Cl.[2] B60T 8/02

U.S. Cl. 303—21 BE **66 Claims**



18. A skid control system for controlling the brakes to at least one wheel of a wheeled vehicle comprising: first control means for providing a first output signal in response to the occurrence of an incipient skid condition at least at the one wheel, second control means for providing a second output signal in response to recovery of at least the one wheel from the incipient skid condition, said second control means comprising means for generating a control signal, said control signal having a first portion of rapidly decreasing magnitude and a second, generally flat portion, said second control means operative in response to said control signal for generating a variable time delay signal operative with said control signal for providing said second output signal, and modulating means responsive to said first output signal for initiating release of brakes and responsive to said second output signal for initiating reapplication of the brakes.

3,912,341

PROGRESSIVE DRAWER SLIDE

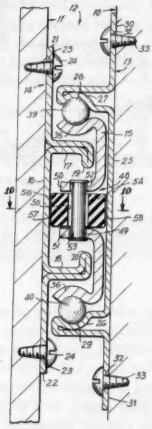
Robert Stein, Mt. Kisco, N.Y., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,676

Int. Cl.[2] F16C 17/00

U.S. Cl. 308—3.8 **4 Claims**

1. A self-compensating drawer slide of the progressive opening type comprising first and second elongated external channel members free of direct connection to each other adapted selectively to be attached to a drawer side and a cabinet surface adjacent said side, an intermediate channel interposed between said exterior channel members, said exterior channel members including vertical, opposed, parallel wall portions, first and second anti-friction bearing means interposed between said intermediate channel and said first and said second external channels, respectively, for enabling relative longitudinal sliding movement of said channels, at least one of said anti-friction bearing means comprising a vertically disposed roller means rotatable about a horizontal shaft fixed to one said channel, the other said channel including a horizontal track supported on said roller means, the width of said track exceeding the width of said roller means to permit relative horizontal movement between the channels connected by said at least



one anti-friction bearing means, a resilient, compressible traction member including a continuous tread having first and second opposed drive portions biased into frictional driving contact with a different one of said parallel wall portions, and mounting means on said intermediate channel securing said traction member against substantial bodily movement longitudinally of said intermediate channel while permitting relative longitudinal movements between said drive portions and said intermediate channel.

3,912,342

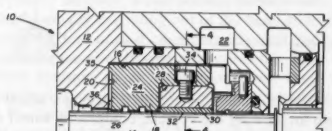
TURBO-MACHINES

Albert C. Schirm, Cheektowaga, and Fred K. Kunderman, Olean, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 9, 1974, Ser. No. 431,823

Int. Cl.[2] F16J 15/28

U.S. Cl. 308—36.3 **4 Claims**



1. An improved seal for turbo-machines including a housing, a shaft journaled in the housing, a cavity in the housing encircling the shaft and means for applying fluid pressure in the cavity, said seal being adapted for location in the cavity and comprising:

an annular seal body having first and second ends, an annular, axially projecting, seal portion on said first end arranged to frictionally and sealingly engage the housing, a plurality of radially spaced, axially projecting lugs on said first end spaced from said seal portion and engageable with the housing, a bore extending therethrough intersecting said ends and sized to receive the shaft, a sealing surface in said bore adjacent the shaft and cooperable with the shaft to prevent fluid flow between said sealing surface and the shaft, and a counterbore in said second end; and,

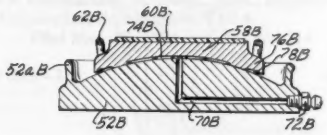
a plurality of bearing shoes movably attached to said body and located in said counterbore, said shoes having a generally arcuate inner surface arranged to slidingly mate with the shaft to maintain said sealing surface concentric with the shaft, whereby fluid pressure applied in the cavity biases said surface portion against the housing to aid in stiffening the shaft.

3,912,343

VEHICLE SIDE BEARING AND FRICTION DAMPER

Hamilton Neil King Paton, 2521 W. Montlake Place E., Seattle, Wash. 98112; John B. Skilling, 3000 Webster Pt. Road NE., Seattle, Wash. 98105, and Frank F. Smith, 914 N. 79th, Seattle, Wash. 98103

Filed Apr. 3, 1974, Ser. No. 457,427
Int. Cl.² B61F *5/14*
U.S. Cl. 308—138 **17 Claims**



1. A bearing, comprising: lower bearing means adapted to be fixed to a load carrying member; upper bearing means adapted to be fixed to a carried member; central bearing means in continuous load bearing contact with said upper and lower bearing means such that vertical loads can be transmitted substantially incompressibly from the carried member to the carrying member; said central bearing means and one adjacent bearing means respectively including a first pair of interengaged surfaces providing omni-directional, arcuate, low friction sliding movement of said central bearing means about a centroid relative to the one adjacent bearing means; said central bearing means and the other adjacent bearing means respectively including a second pair of interengaged surfaces providing omni-directional, planar, low friction sliding movement of the other adjacent means relative to said central bearing means.

3,912,344

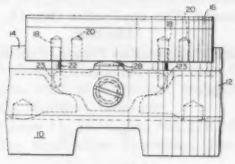
THRUST BEARING ASSEMBLY

James E. McCafferty, Springfield, Pa., assignor to Kingsbury, Inc., Philadelphia, Pa.

Filed Feb. 19, 1974, Ser. No. 443,637
Int. Cl.² F16C *17/06*
U.S. Cl. 308—160 **11 Claims**

1. A thrust bearing assembly including a base ring and a plurality of thrust shoes angularly positioned about and supported by the base ring, means to preclude angular displacement of the thrust shoes relative to the base ring for a given angular setting of the thrust shoes relative to the ring, the angular setting corresponding to a direction of rotation, an axially extending abutment carried by the base ring and upon which the thrust shoes rest in an offset manner, the improvement which comprises, for each thrust shoe,

a. means for adjustably positioning the thrust shoe about the base ring, so that the thrust shoe can be adjusted clockwise and counter clockwise relative to its supporting abutment,



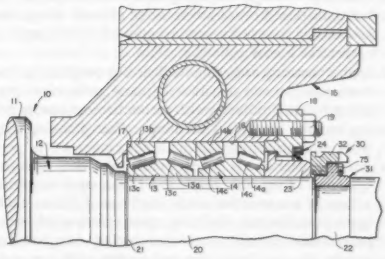
b. whereby the same thrust shoe may be adjusted for offset support for both right and left rotation of a rotatable member.

3,912,345

BEARING CHOCKING ASSEMBLY FOR MILL ROLLS

Harold C. Overton, Gadsden, Ala., assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Aug. 31, 1973, Ser. No. 393,507
Int. Cl.² F16C *35/06*
U.S. Cl. 308—207 R **21 Claims**



1. A bearing chocking device positionable on a shaft in engagement with a groove extending around the shaft for chocking a bearing structure which journals the shaft at a location spaced axially from the groove, comprising:

a. a first ring structure including a plurality of arcuate ring segments engageable with the shaft groove and defining first cam surfaces;

b. a second ring structure having second cam surfaces engageable with said first cam surfaces to effect axial movement of said second ring structure toward and away from the bearing structure as said second ring structure is rotated relative to said first ring structure;

c. retaining means establishing a connection between said first ring structure and the shaft to prevent rotation of said first ring structure relative to the shaft when said second ring structure is rotated relative to said first ring structure; and

d. connection means for securing said ring structures together once said second ring structure has been positioned to properly chock the bearing structure.

3,912,346

DOUBLE-ROW SELF-ALIGNING BEARING

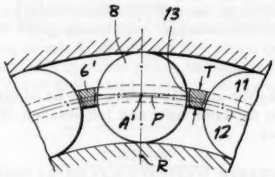
Henryk Boratynski, Poznan; Piotr Kobylecki, Warsaw; Zbigniew Kosicki, Poznan; Stanislaw Marchwiak, Poznan, and Jozef Marciniak, Poznan, all of Poland, assignors to Poznanska Fabryka Lozysk Tocznych, Poznan, Poland

Continuation of Ser. No. 262,681, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 05,869, Jan. 26, 1970, abandoned. This application Oct. 19, 1973, Ser. No. 408,000

Claims priority, application Poland, Feb. 6, 1969, 131583

Int. Cl. F16c *33/00*

U.S. Cl. 308—214 **2 Claims**



1. A double-row self-aligning roller bearing, comprising:

an outer annular member formed internally with an outer race of spheroidal configuration and inwardly concave in cross section;

an inner annular member coaxial with said outer annular member and formed with a pair of axially spaced inner races on opposite sides of a median plane passing through said member perpendicular to the axis thereof, said inner race being of outwardly concave cross section;

a respective array of barrel rollers received in each inner race and rollingly engaging said outer race, said arrays being disposed on opposite sides of each plane, each of said roller arrays having a cone of center axes of the respective barrel rollers;

a spring securing ring received in but projecting inwardly from said outer race in said plane, said inner member being formed unitarily with respective outwardly projecting annular shoulders forming collars flanking opposite sides of each array; and

a pair of frustoconical cages each formed with a plurality of windows along the respective cone and receiving the rollers of a respective array, said barrel rollers each having a rotation axis defining upon rotation of said inner race relative to said outer race about a main bearing axis, a pair of oppositely directed cones, said cages having outer portions lying partially radially outside and inner portions inside said cone, said windows having the profiles of the barrel rollers to be inserted therein along the plane of each window, the portions of the side surfaces of each window lying on both sides of a plane passing through the center of the window being curved in the circumferential direction and being surfaces with straight-lines generatrices which are perpendicular to the last mentioned plane but parallel to said median plane.

3,912,347

DIE CAST BEARING HOUSING AND BEARING THEREOF

Wolfgang Pflugner, and Jurgen Rabe, both of Herzogenaurach, Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

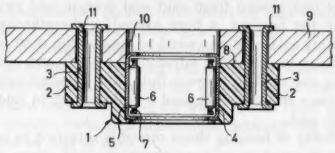
Filed Apr. 1, 1974, Ser. No. 456,895

Claims priority, application Germany, June 8, 1973, 7321526[U]

Int. Cl.² F16C *33/30*

U.S. Cl. 308—236 **1 Claim**

1. A bearing comprised of a die cast bearing housing made of plastic or metal having therein a central bore and at least two lateral bores for securing the housing to a surface and a roller bearing disposed in the central bore consisting of an



outer race and rollers arranged therein, the said outer race extending beyond the housing face which is in contact with the surface on which it is to be mounted.

3,912,348

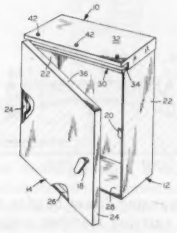
RAINTIGHT ENCLOSURE FOR ELECTRICAL EQUIPMENT

Raymond Kelsey Seymour, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,517

Int. Cl.² A47B *95/00, 96/00*

U.S. Cl. 312—100 **9 Claims**



1. A raintight enclosure for electrical equipment, said enclosure comprising, in combination:

A. a cabinet having opposed sidewalls, top and bottom walls, a backwall, and an open front;

B. a door having a front wall and top, bottom and opposed side edge flanges all at right angles to said front wall;

C. hinges pivotally mounting said door to one cabinet sidewall for swinging movement into closure relation with the open front of said cabinet

1. said opposed side and bottom door flanges overlapping the front edge portions of said side and bottom cabinet walls; and

D. a gutter mounted beneath an overhanging front edge portion of said cabinet top wall to provide a trough extending completely across the open front of said cabinet, with said door in closure relation with the open front of said cabinet, said top door flange entering the space between said top cabinet wall overhanging front edge portion and said trough.

3,912,349

BASE GRILLE OF A HOUSEHOLD REFRIGERATOR

James J. Hoetker, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

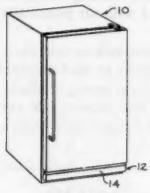
Filed Aug. 19, 1974, Ser. No. 498,648

Int. Cl.² B65D *45/20, 43/00*

U.S. Cl. 312—236 **2 Claims**

1. A movable base grille of a household refrigerator having a face, first and second walls, first and second end walls, a movable integral catch element adjacent and extending along the first wall and being angularly disposed relative thereto,

and a movable integral hinge element extending from the face along the second wall and terminating at a location beyond the second wall, said hinge element having first and second hingedly connected leaves, said first leaf being positioned adjacent the face and the second wall, said second leaf extending outwardly from the hinge connection and having a friction-type connecting element at the end of said second leaf,



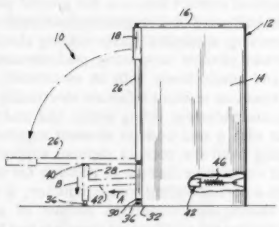
said connecting element being of a spool configuration adapted for insertion into an opening in the refrigerator for fixedly, releasably attaching the grille to the refrigerator and said second wall of the grille having an outer terminal edge portion spaced from the refrigerator in the installed and latched position for providing an air passage beneath the grille and the refrigerator.

3,912,350

ANTI-TIP MECHANISM FOR APPLIANCE

Vincent P. Gurubatham, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 25, 1974, Ser. No. 454,314
Int. Cl.² A47B *46/00*
U.S. Cl. 312—276 **12 Claims**



1. In an appliance having an access door including a front surface and a lower edge and pivotally mounted on a lower portion of one side of said appliance along a horizontal axis so as to be movable between a fully open generally horizontal position and a closed generally vertical position, and anti-tip means for preventing the tipping of said appliance with respect to the floor, comprising:

a single generally vertical panel centered below the access door and in a parallel plane with the closed access door, the panel including an upper portion and a lower portion and having a first position adjacent the lower edge of said access door in its closed position and a second position in a plane substantially parallel to the plane of said first position and interposed substantially perpendicularly between the front surface of the access door and the floor in the open position of the door with said upper portion of said panel having means thereon which are out of contact with the door in the closed position of the door and which receive the front surface of said access door in contacting balanced load supporting engagement in the open position of the door and the lower portion of said panel having means engaging the floor; and

means for moving said panel linearly between its first and second positions in response to the movement of the access door between its closed position and its open position, said first position of said panel corresponding to the closed position of said access door and said second position of said panel corresponding to the fully open position of said access door;

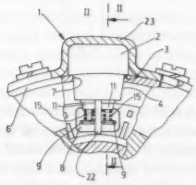
whereby the panel is unobtrusive with the access door in its closed position and furnishes a support for the access door when the access door is in its fully open position.

3,912,351

ELECTRICAL CONNECTING ARRANGEMENT

Kurt Glage, Freiburg, Heutingsheim, and Dieter Raff, Schwieberdingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 11, 1974, Ser. No. 478,394
Claims priority, application Germany, June 19, 1973, 2331094
Int. Cl.² H01R *25/00, 13/50, 33/04, 11/22*
U.S. Cl. 339—48 **17 Claims**



1. In an electrical connecting arrangement, a multi-prong plug unit, comprising, in combination, a plug housing, at least two electrical conductors each leading into said plug housing and having an end portion, at least two prong units each partially accommodated within said plug housing and in electrically conductive engagement with the end portion of a respective one of said electrical conductors, and each partially projecting out of said plug housing, said prong units defining between themselves an intermediate space, at least a portion of each of said prong units being resiliently mounted relative to said plug housing so as to yieldingly press against two electrical contacts spaced in correspondence to the spacing between said prong units when the plug unit is in plugged-in position, and a separating member projecting from said plug housing and extending through the space intermediate said two prong units past said two prong units so as to occupy the space intermediate such two electrical contacts when the plug unit is in plugged-in position, wherein each of said prong units comprises a guide jacket, and an electrically conductive spring member in said guide jacket, one end of said electrically conductive spring member being in direct electrical and mechanical contact with the end of the respective one of said conductors and the other end of said electrically conductive spring member projecting out of said guide jacket.

3,912,352

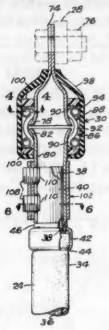
ROTARY ELECTRICAL COUPLING

Joseph D. Kinnear, 3023 E. Eight Mile Road, Warren, Mich. 48091

Filed Apr. 9, 1973, Ser. No. 349,108
Int. Cl. H01r *39/64*
U.S. Cl. 339—8 R **15 Claims**

1. In combination, an electrical cable comprising an outer sheath enclosing wire strands, one end of said cable having said sheath stripped therefrom, a first cylindrical electrical conductor fixedly and nonrotatably secured to said sheath at said one end of said cable and circumscribing in clamped relation said stripped end of the wire strands in electrically conducting relation thereto, an electrical terminal having a second cylindrical electrical conductor nonrotatably connected thereto, said two conductors having generally the same outer diameter and being axially aligned in opposed relation

with their adjacent ends adjacently positioned, a circumferentially resilient connector sleeve encircling said opposed ends of said two conductors and in frictional electrical contact with the outer cylindrical surfaces thereof, said cable being flexible and rotatable and having sufficient torsional resistance to



transmit torque to said first conductor when torque is applied to the cable at a section remote from said first conductor, said first conductor being disposed within said sleeve such that, except for said frictional contact, said first conductor is freely rotatable relative to the second conductor whereby to permit the cable to rotate about its axis relative to said terminal.

3,912,353

CONNECTOR FOR A CIRCUIT CARD HAVING MEANS FOR FORCING SPRING CONTACTS INTO CONTACT WITH THE CARD AFTER THE CARD IS PUT IN POSITION

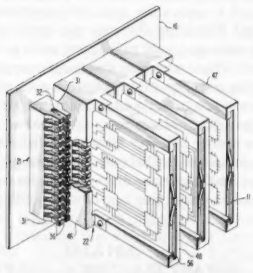
Hiroshi Kasuya, and Norio Watanabe, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,734

Claims priority, application Japan, May 11, 1973, 48-52795

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 MP **10 Claims**



1. A connector for electrically connecting a printed circuit card having a plurality of contacts adjacent one edge of said card to a main printed circuit board comprising;

a. at least one connector block having a base portion affixed to said main printed circuit board, a slot to receive a printed circuit card, and a portion of reduced width opposite said base portion adjacent said card receiving slot;

b. a plurality of electrical spring contacts protruding through said connector block base portion on each side of said card receiving slot, said spring contacts having one end in electrical contact with said main printed circuit board, each of said electrical spring contacts having a first portion projecting inwardly towards said card receiving slot, a second portion projecting outwardly laterally beyond said reduced width portion of said connector block and a third portion projecting inwardly toward said card receiving slot at an angle to the central axis of said card receiving slot, such that no portion of said electrical spring contacts extend into said card slot in said connector block;

c. printed circuit card holding means allowing manual handling of said card without physically touching the card itself; and

d. housing means attached to said card holding means and releasably attachable to said connector block means to deform said electrical spring contacts into the slot in said connector board and, hence, into contact with said card after said card has been inserted into said slots by the card holding means.

3,912,354

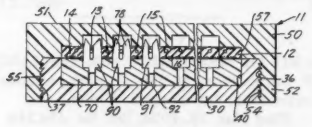
GROUND CONNECTOR FOR SHIELDED CABLE

Donald S. Campbell, and Edward A. Stephan, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 4, 1974, Ser. No. 447,768

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **4 Claims**



1. A ground plane connector for making permanent conductive electrical contact between the ground plane and selected wire-conductors of a longitudinally ribbed shielded flat cable, comprising: a contact carrier having electrically conductive contact element supporting pockets communicating physically and conductively with an electrically conductive surface; at least one resilient bifurcate electrically conductive flat plate contact element fitting within and making conductive contact with a said contact element supporting pocket and extending from the contact element supporting pocket beyond said conductive surface in position for making connection with a corresponding wire-conductor,; a cover fitting over said electrically conductive surface of said carrier, grooved to receive the said contact elements and having transverse ridges extending from adjacent the grooves for assuring alignment of said ribbed cable; and means for aligning said cover on said contact carrier and for maintaining the two in forceful contact with a cable section placed therebetween.

3,912,355

PLUG AND SOCKET CONNECTIONS

Leonard L. Curado, Marshfield Hills; Leonard J. Greshel, Concord, and Paul A. Sorensen, Burlington, all of Mass., assignors to TRW Inc., Cleveland, Ohio

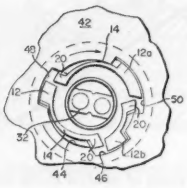
Continuation-in-part of Ser. No. 173,441, Aug. 20, 1971, abandoned. This application Nov. 24, 1972, Ser. No. 309,021

Int. Cl. H01r *13/32*

U.S. Cl. 339—128 **2 Claims**

1. A plug and socket plate combination comprising a socket plate having a central opening and a plurality of peripherally spaced notches communicating with and extending radially outwardly from said central opening and having circumferentially spaced end walls, said plug having a body portion, a radial flange on said body portion for overlying one side of said socket plate, and a plurality of lugs joined to said flange and projecting axially therefrom, said lugs being disposed in circumferentially spaced, cooperating pairs, one lug of each pair being rigidly joined to said flange and having a tang extending circumferentially therefrom in a direction away from

the other lug of the pair, said tang being axially spaced from said flange to provide a socket plate engaging shoulder, the other lug of each pair being carried on the end of a resilient arm which is connected to the rigid lug of the next adjacent of said pairs of lugs, each of said pairs of lugs having oppositely facing, circumferentially disposed cam surfaces which

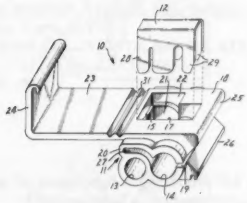


engage said end walls of said notches responsive to axial insertion of said plug into said socket plate to automatically rotatably index said plug into a position wherein said shoulders defined by said tangs on said rigid lugs overlie the other surface of said socket plate to retain the plug in assembly with said socket plate.

3,912,356
SOLDERLESS CONNECTOR

Ronald C. Johansson, Lake St. Croix Beach, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 28, 1974, Ser. No. 473,329
Int. Cl.² H01R 9/08
U.S. Cl. 339—98 **3 Claims**

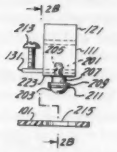


1. A solderless wire-connector comprising a one-piece insulative body member and a resilient conductive contact element, said body member having opposing side edges and a flat face, being channeled to provide parallel longitudinal wire-receiving and wire-supporting channels, and being slotted from said face and transversely of said channels to receive said contact element, said element being slotted in line with said channels to provide open-ended wire-receiving slots, said body being formed with a narrow slot between one of said edges and the adjacent one of said channels, and being formed with a further slot extending from said one channel and terminating at a body hinge area, said body hinge area being located along the opposite edge and between the plane of said face and the nearest plane parallel thereto which is tangent to the channel adjacent said opposing edge.

3,912,357
METER SOCKET

Bohdan Zahaykevich, Newark, N.J., assignor to Federal Pacific Electric Company, Newark, N.J.

Filed Jan. 25, 1974, Ser. No. 436,736
Int. Cl.² H01R 9/00
U.S. Cl. 339—198 M **8 Claims**



1. A meter socket including a base plate of electrical insulation having a first and second side and being formed to define at least one aperture and a plurality of plug-in terminals having clips for receiving terminal blades of a meter, at least one of said plug-in terminals having a first portion comprising the blade-receiving clip thereof, a mounting portion including a laterally extending lip and a transverse portion extending from said first portion to said lip, and a fastener, said first portion overlying said first side of said base plate adjacent said aperture, said aperture having a first aperture portion sufficiently large to receive said transverse portion including said laterally extending lip, a second aperture portion connected to said first aperture portion sufficiently large to receive said mounting portion but too small to receive said laterally extending lip, and a third aperture portion connected to said first aperture portion opposite said second aperture portion sufficiently large to receive a portion of said fastener, said plug-in terminal being capable of having said mounting portion received in said first aperture portion and then laterally shifted into said second aperture portion, said laterally extending lip then overlying said second side of said base plate adjacent said second aperture portion, said portion of said fastener being disposed in said third aperture portion and cooperating with the edges thereof for preventing lateral shifting of said mounting portion out of said second aperture portion and additionally preventing twisting of said plug-in terminal relative to said base plate.

3,912,358
ALUMINUM ALLOY COMPRESSION TYPE CONNECTORS FOR USE WITH ALUMINUM OR COPPER CONDUCTORS

Roger D. Miller, 141 Senaca Drive, Noank, Conn. 06340, and Maurice M. Gilbert, 306 Taylor Lane, Kennett Square, Pa. 19348

Continuation of Ser. No. 371,475, June 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 213,339, Dec. 29, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,179
Int. Cl.² H02G 15/08
U.S. Cl. 339—276 T **5 Claims**

1. A crimpable electrical connector for connecting electrical conductors to electrical terminal equipment comprising:
a body formed of an aluminum alloy having a yield strength of more than 14,000 pounds per square inch,
an elongation of more than 10%, an electrical conductivity that exceeds 60% IACS, and a heat stability such

that the tensile strength, elongation and yield strengths do not change more than 10% over the temperature range of 0° to 400° F. for periods of time up to 4 hours, said body having a pad portion adapted to contact said electrical terminal equipment and a barrel portion adapted to receive said conductors,

said barrel portion having a tensile strength of more than 16,000 pounds per square inch, and

said pad portion having a higher tensile strength than said barrel portion whereby said pad portion is capable of maintaining improved contact pressure with said electrical equipment and said barrel portion is capable of maintaining good electrical contact with substantially all of said conductors, said aluminum alloy containing from 0.6% to 0.9% iron.

3,912,359
MICROSCOPE OBJECTIVES OF GAUSSIAN TYPE HAVING INCLINED OPTICAL AXIS

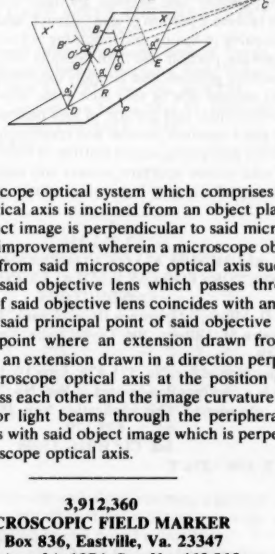
Toshifumi Uetake; Masaki Matsubara, and Yoshisada Hayamizu, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1974, Ser. No. 433,384

Claims priority, application Japan, Jan. 16, 1973, 48-7635; Apr. 11, 1973, 48-40064; July 23, 1973, 48-82832; Nov. 2, 1973, 48-122933

Int. Cl.² G02B 9/36, 21/22

U.S. Cl. 350—36 **16 Claims**



1. In a microscope optical system which comprises microscope whose optical axis is inclined from an object plane and in which an object image is perpendicular to said microscope optical axis, the improvement wherein a microscope objective lens is inclined from said microscope optical axis such that that surface of said objective lens which passes through a principal point of said objective lens coincides with an extension connecting said principal point of said objective lens to an intersection point where an extension drawn from said object plane and an extension drawn in a direction perpendicular to said microscope optical axis at the position of said object image cross each other and the image curvature of said objective lens for light beams through the peripheral zone thereof coincides with said object image which is perpendicular to said microscope optical axis.

3,912,360
MICROSCOPIC FIELD MARKER

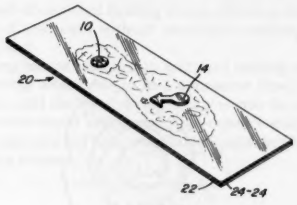
Frank L. Beckel, Box 836, Eastville, Va. 23347

Filed Apr. 24, 1974, Ser. No. 463,812

Int. Cl.² G02B 21/34

U.S. Cl. 350—92 **9 Claims**

1. In combination, a microscopic slide including upper and lower transparent plates with the material to be viewed sandwiched therebetween, a locating and identifying, generally geometrically-configured, transparent, concept-indicating means, said means being capable of alerting the viewer to an area of the magnitude of approximately 1/100,000th of a square inch, and having an optically transparent adhesive layer on one side and a patch of readily removable sheeting attached to said adhesive layer, once said readily removable sheeting is removed, said means being positionable at a desired location on one of said plates to direct subsequent viewers in locating a point of interest in the material sandwiched between said plates, the transparent aspect of said means allowing complete viewing of the material between the plates yet pin-pointing an area of special interest to those viewing the same.



3,912,361
VARIABLE COLOUR LIGHT BEAM PRODUCING DEVICE

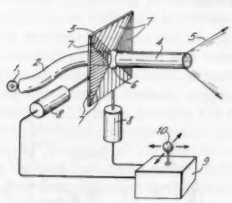
John McDonald Bentley, Loughborough, England, assignor to The Rank Organisation Limited, London, England

Filed Feb. 22, 1974, Ser. No. 445,302

Claims priority, application United Kingdom, Feb. 22, 1973, 8624/73

Int. Cl.² G02B 5/16, 5/22

U.S. Cl. 350—96 B **4 Claims**



1. A device for producing a light beam of variable color, comprising, in combination: a light source;

fibre optic light guide means arranged with an input end adjacent said source;

a composite filter having a central clear area and a number of peripheral areas of different color adjacent said central area, said filter being arranged adjacent the light output end of said light guide means and the central area of the filter having a cross section substantially equal to that of the beam provided by the light guide means;

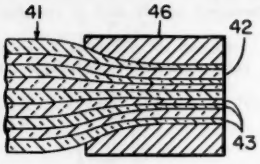
control means for selectively displacing the filter in a plane normal to said beam to cause the beam to pass through selectively variable proportions of the central area and selected said peripheral areas of the filter, to vary selectively the color composition of the beam transmitted by the filter, and

a fibre optic integrating light guide for integrating the light beam after its passage through the filter, said integrating light guide comprising light-conducting fibres the relative positions of which are interchanged randomly between the input and output ends of said guide.

3,912,362
TERMINATION FOR FIBER OPTIC BUNDLE

Marshall C. Hudson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,983
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 B **14 Claims**



1. In an optical communication system of the type comprising

a plurality of optical fibers disposed in side-by-side bundled relationship, each of said fibers including a relatively long light transmitting portion and at least one relatively short end portion, said relatively short end portions of said fibers terminating in a bundle endface, each of said fibers having a core of transparent material surrounded by a layer of transparent cladding material having a refractive index less than that of said core material,

means disposed at one end of said plurality of fibers for retaining said relatively short end portions, and

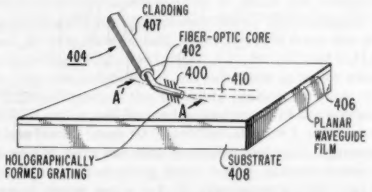
means disposed adjacent to said one end of said plurality of fibers for directing a beam of light onto said bundle endface and initiating propagation of the same optical signal in each fiber,

said fibers being characterized in that the thickness of said cladding material at the end portion of each of said fibers is less than the thickness of said cladding material at the light transmitting portion thereof, the core diameter of the end portion of each fiber being substantially the same as that of the light transmitting portion thereof.

3,912,363
OPTICAL FIBER TO PLANAR WAVEGUIDE COUPLER

Jacob Meyer Hammer, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1974, Ser. No. 437,690
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C **3 Claims**



1. An optical coupler for given light wave energy which is at least quasi-coherent, said coupler compising:

a. a planar optical waveguide including a longitudinal region having a first effective optic waveguide width d_1 for propagating said given light wave energy along said longitudinal region thereof with a first propagation vector k_1 determined by the index of refraction n_1 of said planar optical waveguide and the free space wavelength λ_0 of said given light wave energy,

b. a fibre-optic waveguide incorporating a core having a second effective optic waveguide width d_2 for propagating said given light wave energy in said fibre-optic waveguide with a second given propagation vector k_2 determined by the index of refraction n_2 of said core and the free space wavelength λ_0 of said given light wave energy, n_2 being different from n_1, the surface of a longitudinal portion of said core being inclined at a given oblique angle θ with respect to the length of said longitudinal region of said planar optical waveguide with a surface of said core in sufficient overlapping proximity to a given area of said longitudinal region of said planar optical waveguide to permit the intercoupling of only substantially phase-matched evanescent fields of said given light wave energy over said given area, said given area being defined by d_1, d_2 and θ, and

c. a dielectric line grating sandwiched between said overlapping proximate surface of said core and said given area of said longitudinal region of said planar optical waveguide, the lines of said grating having a line spacing S and being oriented at a second angle ϕ with respect to the length of said longitudinal region of said planar optical waveguide, wherein

$$S = \frac{\lambda_0}{n_2 \sin\theta} \sin\left[\arctan\left(\frac{n_2 \sin\theta}{n_1 - n_2\cos\theta}\right)\right]$$

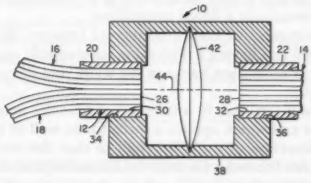
and

$$\phi = \arctan\left(\frac{n_2 \sin\theta}{n_2 - n_1\cos\theta}\right)$$

3,912,364
MIXER FOR OPTICAL WAVEGUIDE BUNDLE

Marshall C. Hudson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,530
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C **6 Claims**



1. In an optical communication system having first and second pluralities of optical waveguides, an optical mixer for coupling a portion of the optical signal propagating in any one of the waveguides of either said first or said second plurality of optical waveguides to all of the optical waveguides of the remaining plurality of optical waveguides, said mixer comprising

first and second support means for disposing the end portions of said first and second pluralities of optical waveguides into first and second bundles, respectively, wherein the axes of said end portions of said first plurality of optical waveguides are maintained linear and parallel to one another, the axes of said end portions of said second plurality of optical waveguides are maintained linear and parallel to one another, and wherein the axes of the end portions of said first plurality of optical waveguides are substantially parallel to the axes of the end portions of said second plurality of optical waveguides, the endfaces of said fiber end portions of said first and second bundles lying in planes which are substantially perpendicular to the axes of said fiber end portions,

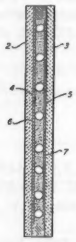
thereby constituting first and second bundle endfaces, respectively, said second bundle endface being spaced from and facing said first bundle endface, and

refractive means disposed between said first and second bundle endfaces for refracting light radiating from all of said optical waveguide endfaces in such a manner that light radiating from any optical waveguide endface in either of said first or second bundles is directed by said refracting means to all of the optical waveguide endfaces of the opposite bundle.

3,912,365
METHOD AND APPARATUS FOR MAINTAINING THE SEPARATION OF PLATES

Francis C. Lowell, Huntington Station, N.Y., assignor to Research Frontiers, Incorporated, Plainview, N.Y.

Division of Ser. No. 166,038, July 26, 1971, Pat. No. 3,742,600. This application June 4, 1973, Ser. No. 366,463
Int. Cl.² G02B 5/23
U.S. Cl. 350—160 R **14 Claims**



1. Apparatus for maintaining the proper separation between the walls of a cell, said walls being in a substantially vertical position containing a liquid comprising:

small non-reactive bodies positioned between the walls of the cell and having a dimension substantially equal to the desired separation between the walls, and surrounded by liquid,

pressure means due to a differential pressure across a wall of the cell which applies a force to the wall of the cell in the direction of the other wall so that the body is held between the two walls and the desired separation is maintained therebetween.

5. Apparatus for maintaining the proper separation between the walls containing a fluid comprising:

small non-reactive bodies positioned between the walls of the cell and having a dimension substantially equal to the desired separation between the walls, and surrounded by fluid,

means for applying a force to a wall of the cell in the direction of the other wall so that the body is held between the two walls so that the desired separation is maintained therebetween,

the means for applying a force to one wall also applies a force to the other wall which is equal and opposite to the first force and wherein these forces hold the bodies between the walls, the forces are caused by the pressure of the fluid in the cell being less at a point in the cell than the pressure of the fluid at the corresponding point outside the walls,

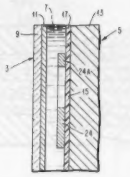
suction means for removing some fluid from the cell to cause the reduced pressure therein, and

wherein the fluid is a fluid suspension containing particles which are capable of having their orientation changed to affect radiation passing through the cell upon the application of an electric or magnetic field to the cell.

3,912,366
LIQUID CRYSTAL DISPLAY ASSEMBLY HAVING POLYIMIDE LAYERS

Gerard J. Sprokel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,236
Int. Cl.² G02F 3/00
U.S. Cl. 350—160 LC **5 Claims**



1. A liquid crystal display cell comprising:

first and second spaced apart support members, said first member being transparent and said second member being reflective;

a transparent layer of imide polymer having a thickness of between about 5 and 10 microns coated on the facing surface of said second member;

a first electrode formed on the surface of said imide polymer layer;

a dielectric coating formed on the surface of said first electrode;

a second transparent electrode formed on the facing surface of said first support member;

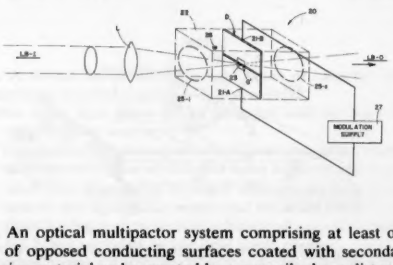
a nematic liquid crystal material located between said electrodes;

and means to apply a voltage of predetermined magnitude and frequency across said electrodes to cause dynamic scattering in said liquid crystal material.

3,912,367
OPTICAL MULTIPACTOR

Michael M. Mann, 4248 Via Alondra, Palos Verdes Estates, Calif. 90274

Filed Oct. 18, 1973, Ser. No. 407,631
Int. Cl.² G02F 1/30, 1/36
U.S. Cl. 350—160 R **11 Claims**



1. An optical multipactor system comprising at least one pair of opposed conducting surfaces coated with secondary emissive material and separated by a prescribed gap distance, this gap being arranged to be kept at a relatively high vacuum; means for maintaining the gap region substantially evacuated; a source of light energy; means for focusing said light energy through said gap, the level and vibration mode of said energy being sufficient to induce an optical multipactor discharge in said gap; and discharge terminating means connected between said surfaces for selectively terminating said discharge, wherein said energy is provided at infrared wave lengths or shorter and disposed to be polarized normal to said emissive surfaces and adapted to oscillate electron clouds between said

surfaces in a prescribed synchronous manner whereby the transit time therefor is on the order of one-half a radiation vibration period.

3,912,368
IMAGE DISPLAY CELL

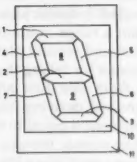
Johannes Jacobus Ponjee; Hendrik Tjapko Van Dam, and Cornelis Johannes Schoot, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,389

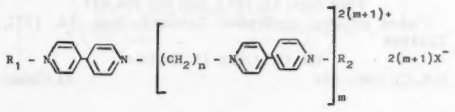
Claims priority, application Netherlands, May 4, 1973, 7306209

Int. Cl.² G02F 1/01; G09F 9/00; C07D 279/00

U.S. Cl. 350—160 R **6 Claims**



1. Image display cell having a transparent wall part and containing an aqueous solution of an N.N′-disubstituted-4,4′-bipyridinium salt as a reversibly reducible redox substance and of a halide as a reversibly oxidizable redox substance, which solution is in contact with at least two inert electrodes, characterized in that the reversibly reducible redox substance either is a compound of the formula 1



where

$m = 0$, in which case R_1 and R_2 represent a linear or branched alkyl, alkenyl, alkoxycarbonylalkyl or phenylalkyl group containing up to 10 carbon atoms which may be substituted with a halogen or a nitrile, or a morpholinocarbonylmethyl group in which the morpholino group may be substituted with one or two methyl groups, and X^- is a monovalent anion selected from the group comprising ClO_4^-, BF_4^-, NO_3^-, Cl^-, Br^-, F^- and $C_6H_5SO_3^-$ so, that the solubility of the substance in water exceeds 10^{-2} mol/litre and the solubility product in water of the radical cation salt formed by reduction of the compound is less than 5 times 10^{-5} mol/liter, or $m = 1$, in which case R_1 and R_2 have the same meanings and each represent an alkyl group containing from 1 to 5 carbon atoms or a benzyl group, and $n = 4$, X^- represents a ClO_4^- ion if R_1 and R_2 each represent an alkyl group containing from 1 to 3 carbon atoms, or a BF_4^-ion, if R_1 and R_2 each represent an alkyl group containing from 2 to 5 carbon atoms or a benzyl group, or $m = 2$ or 3, in which case $n = 4$ and R_1 and R_2 each represent an ethyl group or a propyl group and X^- represents a BF_4^- or ClO_4^-ion, or the reaction product of 4,4′-bipyridyl and an α, ω-dibromo-alkane containing from 4 to 7 carbon atoms obtained in a polar aprotic solvent at temperatures between room temperature and the boiling point of the mixture,

and that as a reversibly oxidizable redox substance an alkali metal bromide or quaternary ammonium bromide having a minimum solubility of 10^{-2} mol/litre is used with the promise that the cation of the bromide does not precipitate with the anion of the reducible redox substance.

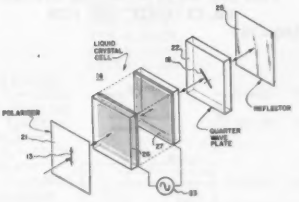
3,912,369
SINGLE POLARIZER REFLECTIVE LIQUID CRYSTAL DISPLAY

Richard A. Kashnow, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 2, 1974, Ser. No. 485,304

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **15 Claims**



1. A reflective liquid crystal display device comprising:

polarizing means for transmitting light in a single polarization direction;

reflecting means;

a source of control signal;

liquid crystal cell means and quarter wave plate means positioned between said polarizing means and said reflecting means and in optical contact therewith, said liquid crystal cell and said quarter wave plate coacting on incident light polarized parallel to said polarization direction for transmitting elliptically polarized light to said reflector, wherein said liquid crystal cell is coupled to said source and modulates said transmission in accordance with said control signal for displaying information and said liquid crystal cell comprises:

a negative dielectric anisotropy liquid crystal material characterized by quasi-homeotropic boundary conditions having easy axes producing a twisted nematic structure in the bulk in the active state.

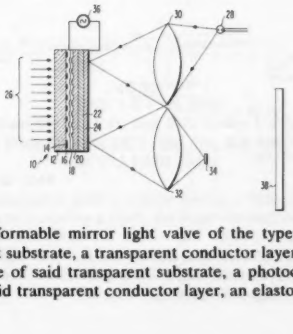
3,912,370
AC DEFORMABLE MIRROR LIGHT VALVE

William Ronald Roach, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,138

Int. Cl.² G02F 1/28

U.S. Cl. 350—161 **7 Claims**



1. A deformable mirror light valve of the type having a transparent substrate, a transparent conductor layer covering one surface of said transparent substrate, a photoconductor layer on said transparent conductor layer, an elastomer layer

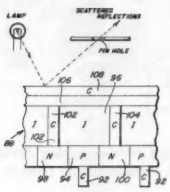
on said photoconductor layer and a deformable mirror on said elastomer layer, wherein the improvement comprises:

an insulating layer disposed between said transparent conductor layer and said photoconductor layer, said insulating layer being of a material having a greater bandgap than each of said photoconductor layer and said transparent conductor layer such that said transparent conductor is transformed into a blocking contact for both polarities of bias voltage.

3,912,371
INTEGRATION FLASH TRANSFER PLATE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 26, 1974, Ser. No. 491,966
Int. Cl.² G02F *1/00, 1/29*
U.S. Cl. 350—161 **6 Claims**



1. In a device for converting an electron image to an optical image, a semiconductor assembly comprising:

a plurality of adjacently situated semiconductor N caps and semiconductor P components forming P-N junctions, disposed in one plane, for producing electron hole pairs at a gain, in response to the impingement of a high energy electron image thereon;

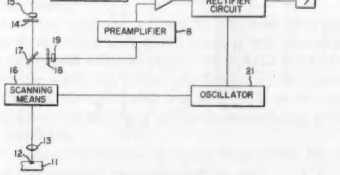
spaced conducting fiber means mounted in respective contact with the N caps for storing electrons, the electron density in the conducting fiber means corresponding with the electron image impinging upon the N caps; and

film means outwardly mounted over the conducting fiber means in spaced relation with the N caps and deformable in accordance with the electron densities in the conductor fiber means over which it is mounted.

3,912,372
PHOTOELECTRIC DETECTOR DEVICE

Shinya Sasayama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 30, 1974, Ser. No. 465,572
Claims priority, application Japan, May 10, 1973, 48-51185
Int. Cl.² G02B *27/00*
U.S. Cl. 356—170 **7 Claims**



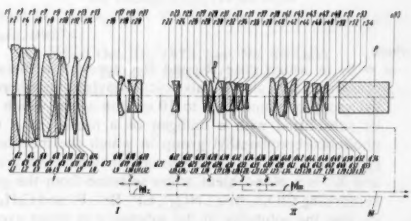
1. A photoelectric detector device for determining whether or not a body formed with a linear mark lies within a predetermined set range, comprising;

1. an image-forming optical system for forming an image of the linear mark in two different planes, respectively;
2. a first plate formed with a first slit and disposed adjacent one of said two different planes, said first slit positioned at a location corresponding to one end of the set range and parallel to said linear mark;
3. a second plate formed with a second slit and disposed adjacent the other of said two planes, said second slit positioned at a location corresponding to the other end of said set range and parallel to said linear mark;
4. first photoelectric converter means for converting into an electrical signal a light signal passed through said first slit in said first plate,
5. a second photoelectric converter means for converting into an electrical signal a light signal passed through said second slit in said second plate;
6. oscillating means for causing the image-forming light beam passing through said optical system and said first and second plates to be oscillated relative to each other at a predetermined frequency so as to scan the image of said mark within a range containing at least the slit portions of said first and second plates; and
7. a processing circuit for taking the difference between the output signals from said first and second photoelectric converter means and deriving from said difference signal a frequency component equal to the oscillation frequency of said oscillating means, thereby providing either a positive or a negative signal when the image of said mark lies within said range and providing either a negative or a positive signal when said image lies outside said range.

3,912,373
HIGH-SPEED VARIFOCAL OBJECTIVE WITH LARGE FOCAL RANGE

Karl Macher, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany

Filed Sept. 12, 1973, Ser. No. 396,427
Claims priority, application Germany, Sept. 14, 1972, 2245105
Int. Cl.² G02B *15/02, 9/64*
U.S. Cl. 350—184 **11 Claims**



1. A varifocal objective comprising:

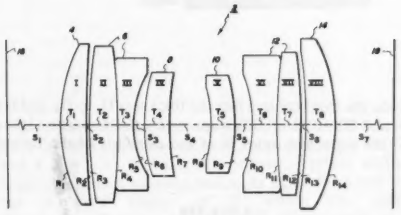
an optical system with seven refractive components on a common optical axis, including a substantially fixed first component of positive refractivity with individual focal length f_1, an axially shiftable second component of negative refractivity with individual focal length f_2, an axially shiftable third component of negative refractivity with individual focal length f_3, a fixed fourth component of positive refractivity with individual focal length f_4, an axially shiftable fifth component of negative refractivity with individual focal length f_5, an axially shiftable sixth component of negative refractivity with individual focal length f_6, and a fixed seventh component of positive refractivity with individual focal length f_7; the individual focal lengths of said fixed components having the relationship $f_1 > f_7 > f_4$, the individual focal lengths of said shiftable components having the relationship $f_3 > f_2$

and $f_5 > f_6$, with $f_1 > f_5 > f_3$ and with the absolute values of f_4, f_6 and f_7 all smaller than f_3; and mechanism coupled with said axially shiftable components for jointly displacing said second and third components while holding said fifth and sixth components stationary in one part of a varifocal range and for jointly displacing said fifth and sixth components while holding said second and third components stationary in another part of said range adjoining said one part, with maintenance of an invariable image plane throughout said range.

3,912,374
SIX COMPONENT ZOOM LENS

Wai-Min Liu, Arleta, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1974, Ser. No. 515,766
Int. Cl.² G02B *15/16*
U.S. Cl. 350—184 **1 Claim**



Lens	Radius (R)	Thickness (T)	Spacings	Refractive Index N_d	Dispersion Value V_d
			S_1 =		
			1.02X--23.30386		
			1.00X--23.57572		
			.96X--24.12286		
			.84X--25.94499		
			.76X--27.27587		
			.71X--28.15127		
			.65X--29.22256		
	R_1=3.59028		.615X-29.84996		
I.		T_1=.57334		1.60729	59.46
	R_2=22.19756				
			S_2 =		
			1.02X--0.10118		
			1.00X--0.10080		
			.96X--0.10320		
			.84X--0.14522		
			.76X--0.20797		
			.71X--0.26421		
			.65X--0.35040		
			.615X-0.41221		
	R_3=15.71092				
II.		T_2=.68986		1.61405	55.17
	R_4=—15.01208				
III.		T_3=.35987		1.56138	45.24
	R_5=2.21852				
		S_3 =.21679			
	R_6=3.43879				
IV.		T_4=.58942		1.66755	41.93
	R_7=5.89206				
			S_4 = .95297		
	R_8=—4.48069				
V.		T_5=.58838		1.66672	48.42
	R_9=—3.95132				
			S_5 =		
			1.02X--.42503		
			1.00X--.42150		
			.96X--.4258		
			.84X--.43355		
			.76X--.43500		
			.71X--.42914		
			.65X--.39850		
			.615X-.36247		
	R_{10}=—3.29131				
VI.		T_6=.55711		1.65016	39.15
	R_{11}=9.81162				
VII.		T_7=.60492		1.58904	53.01
	R_{12}=—10.95050				
			S_6=		
			1.02X--.09775		
			1.00X--.09690		
			.96X--.990		
			.84X--.13327		
			.76X--.19457		
			.71X--.25677		
			.65X--.37350		
			.615X-.47133		
VIII.	R_{13}=—25.8332			1.65844	50.88
		T_8=.68338			
	R_{14}=—4.04334				
			S_7 =		
			1.02X--24.82017		
			1.00X--24.55005		
			.96X--23.99777		
			.84X--22.11392		
			.76X--20.68479		
			.71X--19.71781		
			.65X--18.49627		
			.615X-17.75186.		

1. A variable magnification lens for use between fixed conjugates and including the following components in optical alignment:

a first convex-concave meniscus lens I;
a second double convex lens element II,
a third double concave lens element III,
said second and third elements forming a doublet,
a fourth convex-concave meniscus lens IV,
a fifth concave-convex meniscus lens V,
a sixth double concave lens element VI,
a seventh double convex lens element VII,
said sixth and seventh elements for forming a doublet,
an eighth concave-convex meniscus lens VIII,
said second and third elements and said fourth and fifth lenses being fixed relative to each other as a unit,
said first and eight lenses and said seventh and eighth elements being movable relative to said unit,
the entire variable magnification lens being movable between fixed conjugates,
the parameters of lens radii (R), thickness (T), spacings (S), refractive indices (N), and dispersion values (V) being in accordance with the following table wherein radii, thickness, and spacings are expressed in inches and wherein end-most spacings are those between an end lens and its corresponding conjugate plane:

3,912,375
VEHICLE FAN HUB

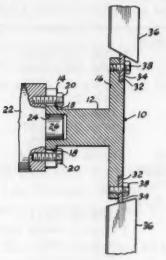
Albert J. Franklin, Sr., P.O. Box 195, Seeley, Calif. 92273

Filed May 10, 1974, Ser. No. 468,959
Int. Cl.² F04D *29/32*
U.S. Cl. 416—244 **3 Claims**

1. In combination with a vehicle having a radiator fan and a water pump including a shaft, the improvement comprising: a fan hub connecting said fan to said water pump in direct drive relation,

said fan hub including a cylindrical body having an apertured annular flange at its respective ends, the aper-

tures in one said flange defining radially spaced slots open to the periphery of said one flange,

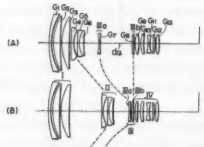


the end of said body adjacent said one flange having a central socket therein for nesting the water pump shaft.

3,912,376
ZOOM LENS SYSTEM CAPABLE OF MACRO-PHOTOGRAPHY

Toshinobu Ogura, Tondabayashi, and Shuzi Ogino, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 391,088
Claims priority, application Japan, Apr. 13, 1973, 48-43785
Int. Cl.² G02B *15/00*
U.S. Cl. 350—186 **5 Claims**



1. In a zoom lens system capable of macro-photography, a zooming lens component, a compensating lens component, one of said components including a first lens group having at least one lens element and a second lens group having at least one lens element, control means for concurrently moving said lens components as units along the lens system optical axis and relative to each other for the purpose of zooming operation, and release means for releasing one of said lens groups from the control of said control means and maintaining it stationary along said optical axis so that the control means performs the control of said movement of the other lens group and the other lens component which does not include said two lens groups with leaving said released lens group at the released position for the purpose of focusing on the macrophotography.

3,912,377
ADJUSTABLE PHOTOGRAPHIC OBJECTIVE

Walter J. Johnson, Mundelein, Ill., assignor to Bell & Howell Company, Chicago, Ill.

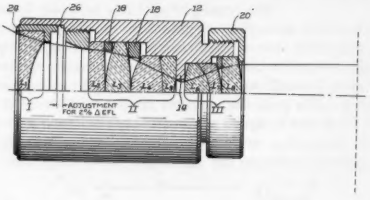
Filed Oct. 21, 1974, Ser. No. 516,691
Int. Cl.² G02B *9/62*
U.S. Cl. 350—215 **1 Claim**

1. An optical system including a plurality of fixed elements and at least one adjustable component, the system having substantially the following specification:

EFL = 18mm
½ Angle of Field = 23° 46'

LENS	RADII	THICKNESS	V	N
L_1	R_1 = 6.0510	D_1 = .053	64.2	1.517
	R_2 = .4620			
L_2	R_3 = 41.3805	D_2 = .088	55.1	1.618
	R_4 = 3.6500			
L_3	R_5 = .7070	D_3 = .127	43.9	1.606
	R_6 = 1.2610			
L_4	R_7 = .3880	D_4 = .164	50.4	1.720
	R_8 = 1.1210			
L_5	R_9 = 1.1210	D_5 = .062	27.6	1.755
	R_{10} = .2510			
L_6	R_{11} = .5000	D_6 = .134	70.4	1.487
	R_{12} = .1898			
L_7	R_{13} = .1898	D_7 = .061	50.4	1.720
	R_{14} = .3600			
L_8	R_{15} = 6.1440	D_8 = .098	63.5	1.552
	R_{16} = .6700			

wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective radii R_1 to R_{16} of the surfaces of the

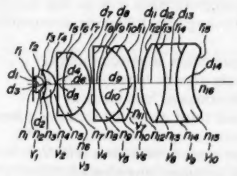


elements; the third column lists the thickness D_1 to D_8; and the fourth and fifth column lists respectively the dispersion index V and the refractive index N of the elements of the optical system.

3,912,378
OIL IMMERSION APOCHROMATIC MICROSCOPE OBJECTIVE

Atsuo Goto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,608
Claims priority, application Japan, Feb. 8, 1973, 48-15127
Int. Cl.² G02B *21/02*
U.S. Cl. 350—216 **3 Claims**



1. An oil immersion apochromatic microscope objective designed to operate with a magnification of 100X and at a numerical aperture on the order of 1.35 and comprising, from front to back, ten lenses arranged in five components, a first component being a semisphere singlet, a second component being a positive meniscus lens with a forwardly concave front face, a third component being a doublet composed of a negative lens and a biconvex fluorspar lens and positively refracting, a fourth component being a triplet composed of two lenses and a biconvex fluorspar lens sandwiched between said two lenses, and a fifth component being a triplet composed of two lenses and a biconcave alum lens sandwiched between said two lenses with a rearwardly concave rear face, the Abbe

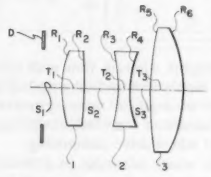
numbers ν_1, ν_2 . . . ν_{10} counted from the front toward the rear of the objective being defined by the following four conditions;

1. $\nu_2 > 80$
2. $55 > \nu_3 > 45$
3. $54 > \nu_8 > \nu_3$
4. $54 > \nu_8 > \nu_{10}$.

3,912,379
THREE ELEMENT OBJECTIVE LENS HAVING ASPHORIC SURFACES ON THE MIDDLE ELEMENT

Donald DeJager, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,226
Int. Cl.² G02B *3/04, 9/16, 13/18*
U.S. Cl. 350—226 **3 Claims**



1. A three element lens comprising, from front to rear, a front biconvex positive element, a middle negative element and a rear positive biconvex element, wherein said middle negative element includes two aspheric surfaces and the lens has a focal length of F, within the range of 25mm $\leq F \leq$ 26mm, when the radii of curvature R, thicknesses T, air spaces S, vertex curvatures C and conic constants K, as numbered by subscript from front to rear, are as defined by the following relationships:

$$\begin{aligned}
9 &\leq R_1 \leq 11\\
60 &\leq R_2 \leq 63\\
29 &\leq R_5 \leq 32\\
11 &\leq R_6 \leq 12\\
&T_1 = 2.1\\
&T_2 = 1.0\\
3.2 &\leq T_3 \leq 3.3\\
&S_1 = 1.5\\
3.1 &\leq S_2 \leq 3.3\\
1.7 &\leq S_3 \leq 1.9\\
0.09 &\leq C_3 \leq 0.10\\
0.10 &\leq C_4 \leq 0.12\\
1.9 &\leq K_3 \leq 2.4\\
1.8 &\leq K_4 \leq 2.0.
\end{aligned}$$

3,912,380
COMPOSITE TYPE STRUCTURE FOR LARGE REFLECTIVE MIRRORS

Leo A. Klein, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 25, 1973, Ser. No. 373,548
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 **4 Claims**

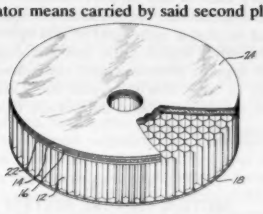
1. A reflective mirror composite structure comprising in combination:

a. a first plate;

b. a honeycomb foundation means of substantially constant thickness carried by said first plate;

c. a second plate carried by said honeycomb foundation means;

d. a felt isolator means carried by said second plate; and

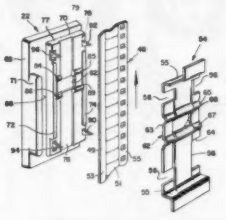


e. a reflective means carried by said felt isolator means and having a reflective surface on one side thereof.

3,912,381
PHOTOGRAPHIC APPARATUS AND METHOD FOR LOCATING FILM IN A PRECISE FOCAL PLANE

Edward F. Burke, Jr., Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,379
Int. Cl.² G03B *1/54*
U.S. Cl. 352—72 **6 Claims**



1. Photographic apparatus for use with a film handling cassette having a housing configured for retaining a strip of photographic film, such cassette housing including an opening in an edge wall thereof configured to present a length of such film strip including an incremental section thereof for photographic operations, a pressure plate located in said cassette housing behind such length of such film strip so as to urge the latter into engagement with an aperture plate of other apparatus, such pressure plate including a pair of laterally spaced members providing contact solely with the margins of the inner surface of such film strip and defining a channel located in parallel relation to the longitudinal axis of such film, each of such spaced members of such pressure plate including a pair of indents longitudinally spaced on each respective member so as to respectively provide an indent therein located at either end of such incremental section, said apparatus comprising:

a housing;

means for receiving such film cassette in an operative location in said housing; and

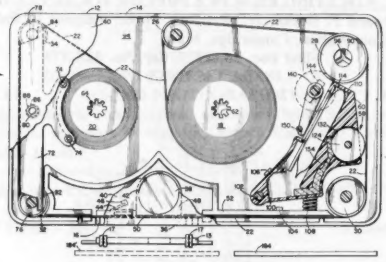
an aperture plate located in operative location to said receiving means, said aperture plate including means for cooperating with such pressure plate to support at least the margins of such incremental section of such film strip in a predetermined focal plane and for deflecting a portion of such film strip adjacent such incremental section so as to stress such incremental section into a planar configuration while preventing contact of the film portion intermediate its margins with such channel or other portions of such pressure plate, said aperture plate including a pair of laterally spaced longitudinally extended film support members each having a film engaging surface configured for contacting and supporting the margins of such film, an aperture located between said film support

members, each of said support members including a pair of pads longitudinally spaced so as to respectively provide one pad located at either end of said aperture, said pads each extending slightly from said film engaging surfaces of said support members and configured to urge the margins of such film strip into such indents so as to thereby transversely bend the portion of such film strip adjoining said aperture.

3,912,382
MOTION PICTURE SYSTEM

Paul B. Mason, Magnolia, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 227,151, Feb. 17, 1972, Pat. No. 3,809,465. This application Jan. 11, 1974, Ser. No. 432,769
Int. Cl.² G03B *17/52*
U.S. Cl. 352—72 **16 Claims**

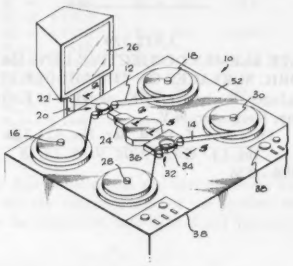


1. A photographic system comprising:
a cassette including:
a housing;
a strip of material stored within said housing;
a normally inoperative applicator system for expressing processing fluid onto an incremental section of said strip of photographic material, said applicator system including a coating roller initially spaced apart from said strip of photographic material and mounted for selective displacement into contact with said strip of photographic material;
a member responsive to externally mounted actuating means, said member being rotatably mounted within said cassette to render said applicator system operative when it is rotated, said member having first means accessible to such externally mounted actuating means and configured for engagement therewith and said member being arranged to selectively effect the displacement of said coating roller from its said initial position into contact with said strip of photographic material when said member is so rotated; and
second means, independent of said member, responsive to externally mounted actuating means for effecting the progressive advancement of said strip of photographic material past said applicator system after said system has been rendered operable; and
apparatus including:
first means for receiving said cassette;
second means for actuating said cassette member including a rotatably mounted member positioned and configured to engage said first means of said cassette member when said cassette is received in said first means of said apparatus; and
third means, independent of said second means of said apparatus, for actuating said second means of said cassette including a rotatably mounted drive shaft configured to engage said first means of said cassette.

3,912,383
FILM TRANSPORT

William H. Stutz, 11672 Margate St., North Hollywood, Calif. 91601

Filed Oct. 23, 1973, Ser. No. 408,623
Int. Cl.² G03B *21/00*
U.S. Cl. 352—129 **7 Claims**



1. In a film transport wherein film with sprocket holes is moved between a supply hub and take-up hub past a readout station by the use of a single main sprocket wheel which moves the film in an arc of the readout station, the improvement of a sprocket wheel drive comprising:
a stepping motor which advances its armature by a predetermined fractional revolution for each input pulse, said armature directly connected to the sprocket wheel to rotate the sprocket wheel at the same speed as the armature;
energizing means for applying pulses at a predetermined rate to said stepping motor;
a flywheel;
a friction clutch coupling the flywheel to the armature to minimize irregularities in armature movement of constant speed operation while facilitating starting of the motor;
an electrically energizable torque motor coupled to the take-up hub to rotate it and an electrically energizable brake assembly coupled to the take-up hub for rapidly stopping it; and
said energizing means includes means for selectively applying said pulses to the stepping motor to rotate the sprocket wheel and applying current to the torque motor, or applying a substantially constant current to the stepping motor while applying current to the brake assembly to simultaneously stop the stepping motor and take-up hub.

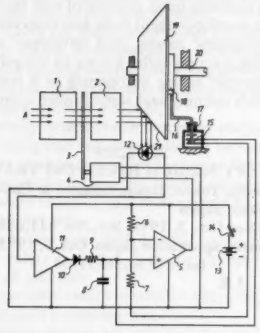
3,912,384
EQUIPMENT FOR FURNISHING A LIGHT DEPENDENT SIGNAL SUBSTANTIALLY INDEPENDENT OF SHUTTER POSITION TO A MOTION PICTURE CAMERA HAVING A ROTARY SHUTTER

Eduard Wagensonner, Aschheim, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 24, 1974, Ser. No. 517,837
Claims priority, application Germany, Oct. 31, 1973, 2343572
Int. Cl.² G03B *7/08*
U.S. Cl. 352—141 **14 Claims**

1. In a motion picture camera having a diaphragm, diaphragm control means for controlling the aperture of said diaphragm in dependence upon a light-dependent signal and a rotary shutter having a light-reflecting surface, equipment for furnishing a light-dependent signal substantially independent of the angular position of said rotary shutter to said diaphragm control means, comprising, in combination, light-sensitive circuit means responsive to light reflected by said light-reflecting surface for furnishing an electric signal corresponding to said light; storage means connected to said light-

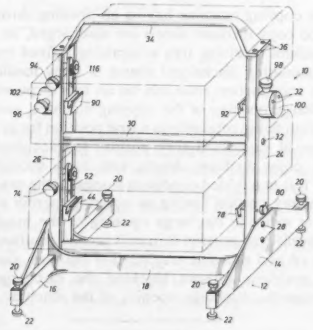
sensitive circuit means and said diaphragm control means, for storing said electrical signal, and furnishing a corresponding stored electrical signal to said diaphragm control means, said stored electrical signal constituting said light-dependent signal; and clearing means connected to said storage means for clearing said storage means for a predetermined short time period following a predetermined number of rotations of said shutter.



3,912,385
MULTI-MEDIA PROJECTOR STAND

John R. Stokes, Austin; James R. Morphew, Garland; James R. Benes, Austin; Eric N. Broline, Austin, and Robert E. Harlan, Austin, all of Tex., assignors to Columbia Scientific Industries Corporation, Austin, Tex.

Filed July 2, 1973, Ser. No. 375,612
Int. Cl.² G03B *1/48*
U.S. Cl. 353—94 **17 Claims**



1. A multi-media projector stand for supporting at least two projectors in order that the projected images from said projectors may be coordinated in any suitable manner, said projector stand comprising:

a base element having opposed upright support elements extending therefrom;

first axis means being defined by said upright support elements and being disposed in transverse relation to said upright support elements;

a first pair of projector carrier elements being adapted to be secured in fixed relation to a first one of the projectors to be controllably supported, said first pair of projector carrier elements being rotatably received by said first axis means;

second axis means being defined by said upright support elements and being disposed in transverse relation to said upright support elements;

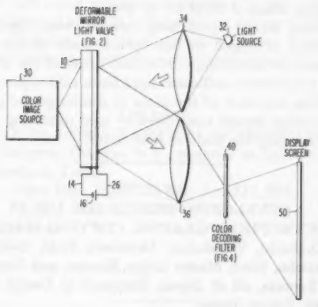
a second pair of projector carrier elements being adapted to be secured in fixed relation to a second one of said projectors to be controllably supported, said second pair of projector carrier elements being pivotally received by said second axis means; and

means for controllably adjusting the orientation of said second axis means relative to said first axis means and achieving controllable positioning of said second pair of projector carrier elements and thus controllably adjusting the position of said second one of said projectors relative to the position of said first projector.

3,912,386
COLOR IMAGE INTENSIFICATION AND PROJECTION USING DEFORMABLE MIRROR LIGHT VALVE

Istvan Gorog, Princeton, and Arthur Herbert Firester, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,527
Int. Cl.² G03B *21/00*; G02B *5/23*; G02F *1/23*
U.S. Cl. 353—122 **8 Claims**



1. A color image intensifier and projector, comprising

a light valve including, in order, a flexible conductive mirror, a deformable layer, a photoconductive layer, a transparent conductive layer, and a plurality of optical diffraction gratings each for a different color,

means to apply an electric potential across said flexible conductive mirror and said transparent conductive layer, means to project an input color image through said gratings to said photoconductive layer, whereby said deformable layer and flexible conductive mirror thereon can be deformed in accordance with the color image as modified by the diffraction gratings,

a Schlieren optical system including means to direct light from a source to said flexible conductive mirror, and means to collect reflected light and direct it through a fourier transform plane to a utilization plane, and

a spatial filter located in said fourier transform plane and having a pattern to recreate the color image at said utilization plane.

3,912,387
ELECTROSTATOGRAPHY

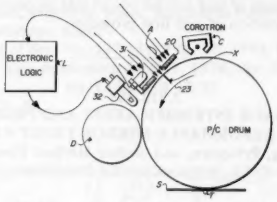
Edric Raymond Brooke, Welwyn Garden City, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1974, Ser. No. 450,269

Claims priority, application United Kingdom, Mar. 30, 1973, 15564/73

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **11 Claims**



1. In an electrostatographic apparatus including a photoconductive plate, means for applying a uniform electrostatic charge to the plate, exposure means for exposing the charged plate to a pattern of light and shadow to produce an electrostatic latent image on the plate, and developer means for developing charged areas of the plate;

detecting means comprising one or more light sensitive devices arranged in the optical path of the exposure means for detecting continuous zones of the plate which do not receive sufficient light from said exposure means during exposure of the plate to discharge the plate; and, discharge means controlled by said detecting means for discharging the plate in said zones.

3,912,388
DEVELOPING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINES

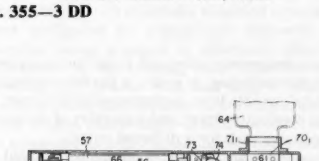
Isao Takahashi, Yokohama; Motoharu Fujii, Tokyo; Kazuo Kawakubo, Hino; Masao Ariga, Komae, and Susumu Sugiura, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 381,398, July 23, 1973, which is a division of Ser. No. 211,276, Dec. 23, 1971, Pat. No. 3,764,208. This application Aug. 23, 1974, Ser. No. 499,985

Claims priority, application Japan, Dec. 29, 1970, 45-127212

Int. Cl.² G03G *15/08, 15/09*

U.S. Cl. 355—3 DD **4 Claims**



1. In an image developing device including a housing, a reservoir for a developing agent mounted on the housing, and a shaft which rotates during operation of said device, wherein said device requires a replenished supply of said developing agent during said operation, the improvement comprising developing means for applying said developing agent to an object to be developed, a cam plate fixed obliquely on said rotatable shaft, a lever pivotally mounted intermediate its length and having a ratchet pawl on one end, means for urging the other end of said lever against said cam plate, a ratchet wheel mounted for rotation by said pawl, and developer agent supply means operable upon rotation of said ratchet wheel to withdraw said developer agent from said reservoir and supply it to said developing means, said developer agent supply means including a supply roller having an irregular outer-surface, said reservoir having an opening in a bottom portion thereof in which opening said supply roller is mounted.

3,912,389
COPY MEDIUM RECEIVING TRAY

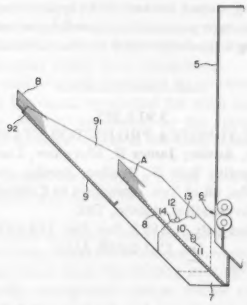
Koichi Miyamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,699

Claims priority, application Japan, Oct. 5, 1973, 48-112140

Int. Cl.² B65H *31/04*

U.S. Cl. 355—3 R **3 Claims**



1. In a copying machine having an opening through which processed copy medium sheets are discharged, an improved copy medium receiving tray comprising a fixed tray portion for accumulating discharged sheets of copy medium, and a movable tray portion rotatable on an axis disposed adjacent the discharge opening of the copying machine, said movable tray portion being rotatable to a first position for providing an extension of said fixed tray portion for accumulating discharged copy medium sheets, and to a second position wherein it is in a folded condition alongside the machine, said movable tray portion having an opening therein disposed in alignment with the discharge opening of the machine when said movable tray portion is in said second position to permit rotation of said movable tray portion between said first and second positions without blocking the discharge of copy sheets from the discharge opening of the machine.

3,912,390
ELECTROPHOTOGRAPHIC APPARATUS

Jozef Marie van Herten, Venlo, Netherlands, assignor to Ocevan der Grinten N.V., Venlo, Netherlands

Filed Aug. 23, 1974, Ser. No. 499,864

Claims priority, application Netherlands, Aug. 31, 1973, 7311992

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **4 Claims**

1. In an electrophotographic apparatus comprising

an elongate photoconductive belt providing a multiplicity of successive areas for image formation thereon,

means for driving a flight of said belt continuously through a processing path having image forming stations and an image transfer station spaced apart therealong,

means for feeding copy sheets individually to said belt at said transfer station;

means at said stations for, respectively, electrostatically charging said belt, imagewise exposing said belt to form a latent image thereon, developing the latent image into a transferable image, and transferring the transferable image from said belt to a copy sheet,

means for fixing the transferred image on the copy sheet,

and control means, respectively, for activating and inactivating said driving means, and charging means, said exposing means, and said sheet feeding means,

the combination which includes:

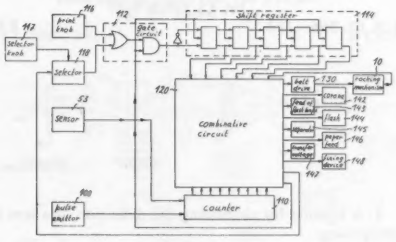
a multiplicity of detectable marks on and equally spaced apart along said belt so as to define between said marks equally sized belt sections for image formation,

sensor means for generating a pulse signal in response to movement of any of said marks past a fixed point in the path of said belt,

means connected with said driving means for generating electric pulses having a frequency proportional to the velocity of said belt,

manually operable switch means for energizing said driving means to start a printing run,

selector means settable according to the number of copies to be made in a printing run, and which generates a copy signal when demanding more than one copy to be so made,



counter means for counting said pulses and including means for resetting itself to zero count condition and renewing its count in responsive to any pulse signal of said sensor means, said counter means being operative to produce groups of output signals that differ for different counts of said pulses,

a shift register having a plurality of successively activatable outputs and being operative to shift the signal condition existing at any of its outputs to the next in its succession of outputs in response to a pulse signal of said sensor means,

means for activating the first of said outputs of said shift register in response to the combination of a pulse signal from said sensor means and either a signal from said switch means or a copy signal from said selector means, and a combinative circuit having a plurality of outputs connected respectively with the respective control means aforesaid, said combinative circuit being responsive to respective combinations of the output signals of said counter means and the output signals of said shift register to produce respective signals to said control means whereby said driving means, said charging means, said exposing means and said sheet feeding means, respectively, are activated and inactivated, respectively, at moments precisely related to the movements past said sensor means of those of said marks on said belt which pass said sensor means after an actuation of said switch means.

3,912,391

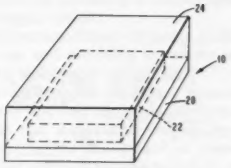
OPTICAL INFORMATION STORAGE AND RETRIEVAL SYSTEM WITH OPTICAL STORAGE MEDIUM

Harold Fleisher; Harris, Thomas J., and Eugene Shapiro, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1963, Ser. No. 332,755

Int. Cl. G03b *27/44*; **G11b** *5/00*

U.S. Cl. 355—54 **47 Claims**



1. An optically accessible information storage unit comprising:

a transparent medium;

said medium being distinguishable with each accessing into a plurality of discrete independently accessible information storage areas;

each of said areas including a plurality of light scattering layers formed in depth in the medium during the independent accessing and corresponding to the information stored within that information storage area.

3,912,392

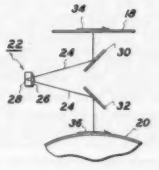
SHORT FOCAL LENGTH OPTICAL SCANNING SYSTEM

David K. Shogren, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,599

Int. Cl.[2] **G03B** *27/70*

U.S. Cl. 355—66 **7 Claims**



1. An optical imaging system for projecting images from an object surface to an image surface including:

a plurality of optical imaging devices arranged between said surface,

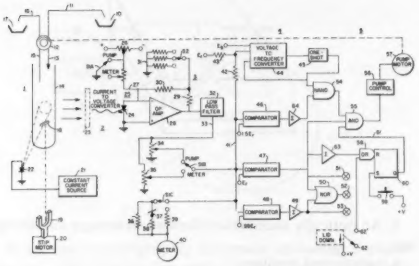
each of said imaging devices being disposed on a folded optical axis and including a projection lens element and a roof reflector adjacent to said projection lens element to fold said optical axis back through said projection lens element so that light propagating from said object surface to said projection lens element and said roof reflector is reflected back through said projection lens element to said image surface, said projection lens element being thus twice traversed by said propagating light and effective to project an image from said object surface onto said image surface,

whereby an upright ordered composite image of said object surface is projected onto said image surface by said plurality of optical imaging devices.

3,912,393
MEASUREMENTS AND ADJUSTMENTS OF CONCENTRATED SOLUTIONS

Miles G. Hossom, Wheaton, and Keith R. Johnson, Rockville, both of Md., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 23, 1973, Ser. No. 353,812
Int. Cl.[2] G01N *1/00*
U.S. Cl. 356—36 **30 Claims**



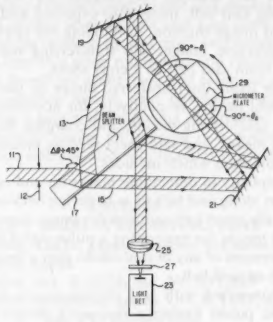
1. Apparatus for adjusting the concentration of a solution comprising:
   means for detecting the concentration of a solution;
   means for producing an electrical signal representative of the detected concentration of said solution;
   means for comparing said produced electrical signal with a reference value representative of the concentration of a standard solution; and
   means for delivering a diluent to said solution at a rate which varies in accordance with the magnitude of the difference between said produced electrical signal and said reference value until the concentration of solution is adjusted to substantially equal the concentration of said standard solution, said last-named means acting to deliver diluent to said solution at a first continuous rate whenever said magnitude of the difference between said produced electrical signal and said reference value exceeds a selected value until said difference in magnitude reaches said selected value and to deliver diluent to said solution at a second, periodic rate whenever said difference in magnitude is less than said selected value until the concentration of solution is adjusted to substantially equal the concentration of said standard solution.

3,912,394
METHOD AND SYSTEM OF INTERFEROMETRIC MEASUREMENTS OF MODULATION TRANSFER FUNCTIONS

Dennis Kelsall, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 6, 1974, Ser. No. 477,108
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—113 **4 Claims**

1. An interferometric system for modulation transfer function measurements comprising:
   a. a source of collimated light;
   b. a beam splitter in the path of the collimated light and dividing the light into first and second beams;
   c. a first reflecting surface in the path of the first beam;
   d. a second reflecting surface in the path of the second beam, the first and second reflecting surfaces being positioned to reflect the beams to other of the reflecting surfaces causing the paths of the beams to intersect, and the second reflection causing the beams to converge at the beam splitter and form a single recombined beam;
   e. means positioned at the intersection of said beams for changing the path length and the shear of the first and second beams; and

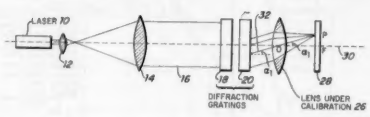


   f. means for detecting the single recombined beam.

3,912,395
OPTICAL SYSTEM CALIBRATION METHOD

John A. Voggenthaler, Sunnyvale, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 6, 1970, Ser. No. 25,813
Int. Cl. G01b *9/00*
U.S. Cl. 356—124 **8 Claims**



1. A method for calibrating the distortion of a lens system comprising:
   a. providing a collimated beam of light;
   b. passing said collimated beam of light through a diffraction grating for providing a plurality of diffracted wave fronts emerging from said grating;
   c. positioning the lens system to be calibrated in the path of said diffracted wave fronts emerging from said grating for focusing a plurality of images on an image receiving surface;
   d. locating the correct positions of said plurality of images for an undistorted lens system;
   e. locating the actual positions of said plurality of images on said image receiving surface; and
   f. comparing the differences between said actual and correct positions for said plurality of images, said differences representing the distortion present in said lens system.

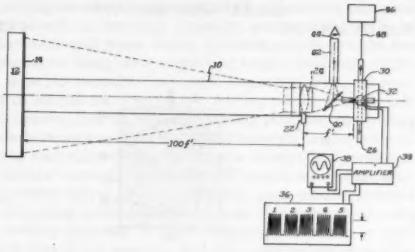
3,912,396
ELECTRONIC LENS TESTER

Rudolf Hartmann, Skokie, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 23, 1973, Ser. No. 363,087
Int. Cl. G01b *9/00*
U.S. Cl. 356—124 **15 Claims**

1. A device for determining the image forming quality of a lens which comprises an object target having a plurality of individual and separate grate patterns with parallel grate lines, means for removeably mounting the test lens for focusing the object grate as an image at an image plane, a slit located at the lens image plane, means mounting said slit for lateral movement relative to the target and along and at the image plane with the slit parallel to the target grate lines, and means for

detecting lens modulation as changes in image illumination at said slit during movement of said slit, said separate patterns being arranged in alternate rows along said object target in the

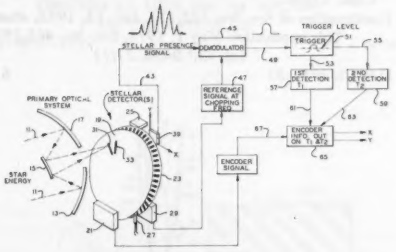


direction of movement of said slit and each of said patterns defining only a portion of the lens field of view in the direction of the length of the slit and being imaged in only a portion of the image plane along the length of the slit.

3,912,397
STELLAR SCANNING-CHOPPING SYSTEM

Bart J. Zoltan, Emerson, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 8, 1973, Ser. No. 321,895
Int. Cl. G01b 11/26
U.S. Cl. 356—141 **8 Claims**



1. In a stellar scanning system, apparatus to provide an output indicative of the position of a star in two orthogonal directions comprising:

A. telescope covering the field of view in which the star is expected to be found;

B. a first disc having thereon a first slit along a radius of said disc and a second slit adjacent and at an angle thereto, said disc being at the focal plane of said telescope;

C. a second disc located on the side of said first disc opposite said telescope, said disc containing along radii thereof alternate clear and opaque areas, the spacing from one opaque area to the next being equal to the width of the slits in said first disc;

D. means to effect relative motion in a direction essentially perpendicular to said first slit between said first disc and the star;

E. means coupled to said first disc and providing an output indicative of the position thereof with respect to a known reference;

F. means to rotate said second disc at a speed substantially greater than rate of relative motion of said first disc;

G. means to provide an output indicative of the modulation frequency of said second disc;

H. a photosenitive detector placed on the side of said second disc opposite said first disc and aligned with the slits on said first disc, whereby from the output of said detector, said modulation frequency and the output of an encoder, the X and Y position of a star imaged on said first disc may be determined;

I. a demodulator obtaining its signal input from said first detector and its reference input from said second detector;

J. a trigger circuit coupled to the output of said demodulator and responsive to a signal therefrom having a magnitude representative of the light illumination from a star;

K. a first detection circuit obtaining its input from said trigger circuit and providing an output upon a first input from said trigger circuit;

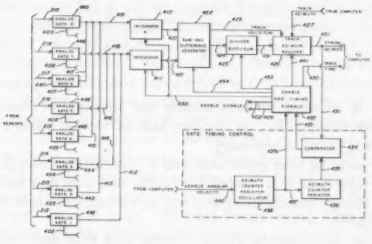
L. a second detection circuit obtaining its input from said trigger circuit and providing an output after a second detection by said trigger circuit; and

M. means having as inputs the output of said encoder and the outputs of said first and second detection circuits and providing as first and second outputs the value of said encoder input at the occurrence of respective outputs from said first and said second detection circuits.

3,912,398
STROBOSCOPIC CELESTIAL SCANNER

George Edward Zenk, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 21, 1973, Ser. No. 427,185
Int. Cl. G01b 11/26
U.S. Cl. 356—152 **16 Claims**



1. Apparatus receiving an angular velocity signal encoding the approximate speed of rotation of a body with respect to an external radiant energy source directing radiant energy toward the body and supplying signals indicative of the angular position of the body with respect to the radiant energy source, comprising:

a. first through at least second radiant energy sensors each having a predetermined field of view, and adapted to be positioned in the body so that the predetermined field of view of each sensor sweeps over the radiant energy source by ascending numerical order of the sensors with each revolution of the body, each sensor producing, responsive to enable signal, an output signal indicating the amount of radiant energy directed toward the sensor from within its field of view during a sensing interval specified by the enable signal;

b. sensor enabling means receiving the angular velocity signal for issuing responsive thereto an enable signal to each sensor during at least two successive revolutions of the body causing a sensing interval of at least two sensors to occur while their fields of view are sweeping over a first selected area and a sensing interval of at least two sensors to occur while their fields of view are sweeping over a second selected area, the two areas being selected such that the radiant energy source is within the field of view of at least one sensor during its sensing interval on at least two successive rotations of the body; and

c. signal integration means receiving the sensor output signals for producing for each rotation of the body first and second integration signals respectively encoding the

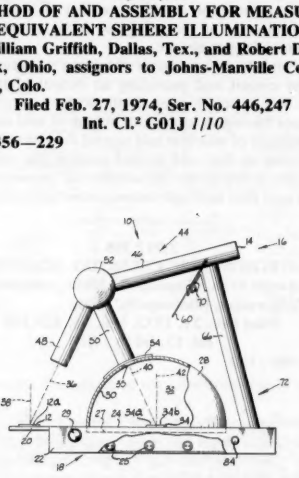
total radiant energy received by the sensors during their sensing intervals while their fields of view are sweeping over the first and second selected areas, whereby the difference in said integration signals is indicative of the angular position of the body with respect to the radiant energy source.

3,912,399

METHOD OF AND ASSEMBLY FOR MEASURING EQUIVALENT SPHERE ILLUMINATION

James William Griffith, Dallas, Tex., and Robert Dale Zeller, Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 27, 1974, Ser. No. 446,247
Int. Cl.² G01J 1/10
U.S. Cl. 356—229 **30 Claims**



1. A method of determining the amount of equivalent sphere illumination on a given task as viewed from a given viewing point, comprising:

a. locating said given task and a contrasting colored given reference in a lighted first area, said task and reference being oriented in a fixed way as viewed from said viewing point;

b. at said viewing point, viewing said task and reference through adjustable light filtering means;

c. adjusting said light filtering means to an adjusted position to provide specific visibility of said task from said viewing point and through said filtering means while causing the luminance of said reference at least to appear unchanged as viewed through said adjusted filtering means from a predetermined point behind said filtering means regardless of the adjusted position of said light filtering means;

d. positioning a second task and a second reference, respectively similar in color to said given task and given reference, in a second area, said second task and second reference, as viewed from an associated viewing point, being oriented in substantially the same way as said given object and given reference are oriented as viewed from said given viewing point;

e. illuminating said second task and second reference with sphere illumination;

f. with said light filtering means fixed in said adjusted position, viewing said second task and second reference through said filtering means from said associated viewing point;

g. varying the intensity of sphere illumination on said second task and second reference until the visibility of said second task, as viewed from said associated viewing point through said filtering means, is substantially equal to said specific visibility while causing the luminance of said second reference at least to appear unchanged as viewed through said filtering means from a associated predetermined point; and

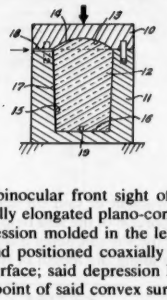
h. thereafter, measuring the intensity of sphere illumination on said second task.

3,912,400

MOLDED BINOCULAR GUN SIGHT LENS STRUCTURE

George C. Luebkeman, Cleves, Ohio, assignor to W. R. Weaver Company, El Paso, Tex.

Filed Jan. 31, 1974, Ser. No. 438,359
Int. Cl.² G01C 9/02, 9/12
U.S. Cl. 356—247 **4 Claims**



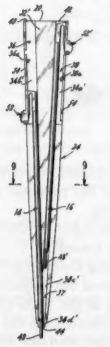
1. A lens for the binocular front sight of firearm barrels having a molded axially elongated plano-convex, transparent body; a minute depression molded in the lens body through the planar surface and positioned coaxially with the optical axis of the convex surface; said depression having a bottom located on the focal point of said convex surface; a spot producing material filling the depression; and a transparent cover means secured to the planar surface surrounding and enclosing said spot producing material in the depression.

3,912,401

MECHANICAL WRITING INSTRUMENT

Nathan A. Zepell, 1359 Santa Teresita Drive, Santa Barbara, Calif. 93105

Continuation of Ser. No. 322,770, Jan. 13, 1973, abandoned.
This application May 1, 1974, Ser. No. 465,752
Int. Cl.² B43K 27/12
U.S. Cl. 401—31 **6 Claims**



1. A writing instrument having a plurality of writing points comprising a body including body walls having opposed substantially flat faces and opposed side walls, each of said flat faces having a transverse dimension substantially greater than the transverse dimension of said side walls, said side walls extending between said flat faces to provide a substantial transverse rectangular configuration for said body, said flat faces and side walls forming channel walls and defining at least two elongated and straight channels, guide means extending inwardly from at least one of said flat faces and located between said channels, said channels being disposed in a substantially common plane intermediate said flat faces, said channels being disposed at an acute angle with respect to each other and converging into a common point opening at the bottom end thereof, the side walls of said body being tapered toward each other from substantially the top end to the bot-

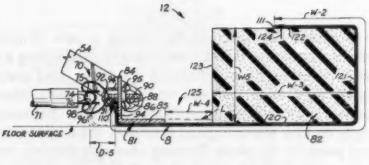
tom end thereof and converging at said point opening such that said body has a continuously decreasing cross section from substantially the top end to the bottom end thereof, at least two elongated writing members each having a longitudinal axis and each having a writing point at one end thereof, said writing members being respectively disposed in said separate channels in retracted positions and mounted to be in contact with said guide means for substantially straight line reciprocation along their respective longitudinal axes within said separate channels from their respective retracted positions to extend their respective writing points through said point opening into an extended writing position, said writing members remaining at substantially constant angles with respect to each other during the entire straight line reciprocation in their respective channels, and respective manual actuating means operatively connected to each writing member and extending exteriorly of said body for manually moving said writing members in their respective channels at least toward said point opening and into said extended writing position, the spacing between the channel walls of said opposed substantially flat faces which define said channels being of a dimension substantially equal to the dimensions of said writing members in transverse section, and the spacing between said opposed substantially flat faces being established to provide the requisite structural walls for said channels yet to minimize the dimension of said body at right angles to said plane whereby said body is relatively thin.

3,912,402

LIQUID DISPENSING DEVICE

Wayne K. English, Rte. 2, Box 921, Roanoke, Ala. 36274

Filed May 13, 1974, Ser. No. 469,326
Int. Cl.² A47L *13/26*
U.S. Cl. 401—139 **11 Claims**



1. A device for spreading liquid on a floor comprising:

dispensing means for discharging the liquid on the floor as said dispensing means is moved over the floor; and,

spreading means for spreading the liquid discharged onto the floor by said dispensing means, said spreading means operatively associated with said dispensing means for trailing said dispensing means as said dispensing means is moved over the floor, said spreading means comprising:

a spreading member movable over the floor and the liquid dispensed thereon,

first forcing means for exerting said spreading member against the floor at a first prescribed position and at a first prescribed force, and

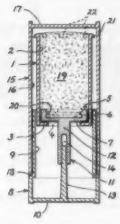
second forcing means for exerting said spreading member against the floor at a second prescribed position spaced from and trailing said first prescribed position and at a second prescribed force.

3,912,403

STICK-SHAPED DISPLACEABLE DELIVERY CASE FOR PASTEOUS SUBSTANCES

Poul Anker Gjerloff, 26 Sobakken, 2920 Charlottenlund, Denmark

Filed June 7, 1973, Ser. No. 367,703
Claims priority, application Denmark, June 15, 1972, 2989/72; Aug. 31, 1972, 4315/72
Int. Cl.² A47L *13/30*
U.S. Cl. 401—176 **4 Claims**



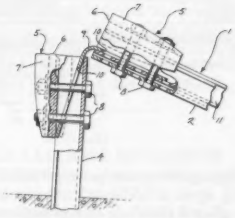
1. A stick-shaped displaceable delivery case for pasteous substances, e.g. for gluesticks and deodorant sticks, comprising a tubular sleeve (**1**) having an open upper end, and a stick-holder (**5**) displaceable therein, the sleeve (**1**) being axially displaceable in a cup-shaped base (**8**), the open end of the base surrounding the sleeve (**1**) commencing at the bottom end thereof, the holder (**5**) being supported by means of a support member (**11**) extending through the sleeve (**1**) at the lower end thereof, said support member being of two interengaging parts, one part extending downwardly from said holder and the other part extending upwardly from said cup-shaped base, characterized in that the sleeve (**1**) constitutes a container for the pasteous substance and at its open end is provided with a radially extending circumferential applicating flange (**21**), said stick holder serving to discharge the pasteous substance from the open end of said sleeve as said sleeve is telescoped by said base, and said flange being operable to spread the freshly discharged substance upon the surface being treated progressively with said discharge.

3,912,404

HIGHWAY POST CONSTRUCTION

Herbert L. Katt, 4107 Pennington Lane, Racine, Wis. 53403

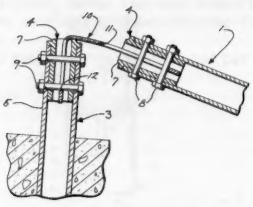
Filed Jan. 2, 1975, Ser. No. 537,965
Int. Cl.² F16B *7/00*
U.S. Cl. 403—2 **6 Claims**



1. A post construction of the type having a frangible coupling supporting an upper section of post upon a lower base section of post, and comprising at least one bolt extending through each post section and securing the same to the coupling, and a tie strip carried by said bolts with a lost motion slot at one end thereof for receiving one of the bolts and providing a limited freedom of movement for the upper post

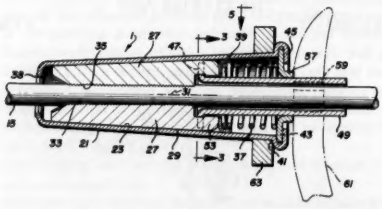
section following an impact which breaks the frangible coupling.

3,912,405
FRANGIBLE POST COUPLING
Herbert L. Katt, 4107 Pennington Lane, Racine, Wis. 53403
Filed Jan. 2, 1975, Ser. No. 537,966
Int. Cl.² F16B 7/00
U.S. Cl. 403—2 **3 Claims**



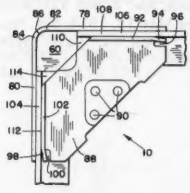
1. A post having a frangible coupling, comprising a substantially cylindrical tubular upper post section disposed upright upon a base having a correspondingly upright tubular lower section in alignment therewith, and a frangible coupling joining said post sections, said frangible coupling comprising a cylindrical tubular member telescoped by said post sections from opposite ends of said member, transverse bolts extending through each post section and the corresponding telescoped end of said member to support the assembly upon said base, a frangible circumferential zone centrally of said member to provide for breakage of the member upon lateral impact against said upper post section, and a tie link carried by said bolts and having a lost motion connection therewith to limit the movement of said upper post section after severance of said member at said frangible zone.

3,912,406
GRIPPER WITH CENTER PULL FEED THROUGH RELEASE MEMBER
James L. McGrath, Medinah, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.
Filed July 15, 1974, Ser. No. 488,731
Int. Cl.² F16G 11/04
U.S. Cl. 403—19 **2 Claims**



1. A gripping device comprising a hollow tubular shell, said shell being open at its opposite ends and being internally conically tapered from one of said ends toward the other end, a jaw cluster in said shell, said jaw cluster having jaw segments that are circumferentially disposed about the axis of said shell that extends between said ends, each jaw segment having a tapered exterior surface, said tapered exterior surfaces of the jaw segments defining substantially conical surface portions conforming approximately to the internal conical surface of said shell, said jaw segments also defining a bore centered on said axis, said jaw segments having teeth presented to said bore for engagement with a tendon that is gripped by the device, a spring between the larger diameter end of said shell and the jaw cluster for applying axial pressure against the jaw cluster in the direction of the smaller diamter end of the shell to urge the jaw segments against the tendon, and means at the larger end of the jaw cluster for retaining the jaw segments assembled in the cluster; said last-named means comprising a one piece release tube extending from within said shell outwardly of the larger diameter end of the shell and being centered on said axis, said release tube having an internal diameter greater than the bore defined by said jaw segments so that the tendon gripped by said jaw segments can pass freely through said tube beyond the end of the tube that is outwardly of the shell, the end of the tube within the shell being shaped to form a substantially flat washer that is substantially perpendicular to said axis, said washer and the ends of said jaw segments having parts interengaging such that joint movement of the jaw segments and the release tube toward said larger diameter end is permitted so that the jaw cluster can be released from the tendon by an axial pull on said release tube in the direction away from said shell, and means on said tube outwardly of said shell forming a grip for a tool through which to exert said pull, said last-named means comprising opposed notches on opposite sides of said axis.

3,912,407
CORNER CONNECTOR
Richard T. Heininger, Gardner, Mass., assignor to GEM Industries, Inc., Gardner, Mass.
Filed July 30, 1974, Ser. No. 493,177
Int. Cl.² B25G 3/00; F16B 7/00
U.S. Cl. 403—406 **8 Claims**



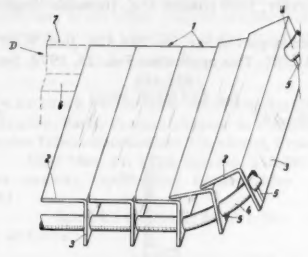
1. A corner construction for joining a pair of elongated members adapted to be secured together comprising a pair of plates secured together in flatwise condition, said plates having unsecured edge portions at angles to each other, said unsecured portions being slightly separated sufficiently to slidingly receive the elongated elements to be connected, and spaced parts on the plates forming channels slidably receiving said elements at end portions thereof, the end portions of said elements being adjacent to each other and divergent,

said plates including upturned parallel flanges on both plates forming additional channels at general right angles to the first named channels, said elongated elements being angle irons each of which includes two flanges generally at right angles to each other, said flanges being receivable in the respective channels.

3,912,408
COVER FOR CHANNELS AND DUCTS
Arno Domnick, Biener Strasse 7, Holthausen, Germany
Continuation of Ser. No. 262,074, June 12, 1972, abandoned.
This application Mar. 14, 1974, Ser. No. 451,145
Claims priority, application Germany, June 11, 1971, 2128870
Int. Cl.² E01C 5/16
U.S. Cl. 404—35 **6 Claims**

1. A collapsible cover assembly for covering channels, ditches and the like, the cover comprising a plurality of rigid individual strips which, jointly form a substantially plane closed supporting surface when said cover assembly is in an

operative non-collapsible state, and connecting means flexibly joining said individual strips to each other, said assembly is collapsed by being rolled into a roll, said individual strips being substantially parallel to the axis of said roll, said connecting means including at least one wire which is connected to said individual strips and extends transversely thereto, said



individual strips have the shapes of inverted angle irons when said cover assembly is in an operative state, each of said inverted angle iron-shaped individual strips having a horizontal leg forming said supporting surface and a vertical leg forming a back, the free edge of the horizonal leg of each individual strip bearing against the back of the adjacent individual strip.

3,912,409

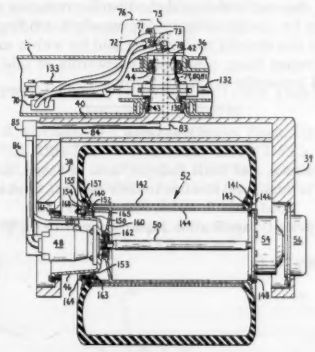
ROTARY FLUID SEAL FOR STEERING YOKE OF WHEEL MOTOR-DRIVEN VEHICLE

George D. Herbst, Milwaukie, Oreg., assignor to Hyster Company, Portland, Oreg.

Division of Ser. No. 217,916, Jan. 14, 1972. This application Oct. 15, 1974, Ser. No. 514,417

Int. Cl.² E01C *19/26*

U.S. Cl. 404—122 **8 Claims**



1. In a self-propelled compaction vehicle having a main frame, a compaction wheel at one end of said frame and a steerable yoke-mounted driving wheel at the opposite end of said frame driven by a hydraulic wheel motor, said yoke including a yoke spindle rotatably mounting said yoke to said frame, ann engine-driven pump means on said frame for supplying said wheel motor with pressure fluid, and hydraulic passage means extending between said wheel motor on said yoke and said pump means on said frame,

a rotary seal means for transmitting pressure fluid between said yoke and said frame comprising:

a seal housing on said frame having an interior wall defining a bore,

a seal shaft rotatable within said bore about the axis of rotation of said yoke spindle,

means defining a pair of first and second annular fluid grooves in said seal shaft at vertically spaced-apart positions along said shaft,

a fluid port extending through said seal housing to said interior bore wall and into fluid communication with each of said annular fluid grooves,

first fluid passage means extending lengthwise through said yoke spindle and continuing into the interior of said seal shaft and into communication with said first annular fluid groove,

a second fluid passage means extending lengthwise through said yoke spindle and continuing into the interior of said seal shaft and communicating with said second annular fluid groove,

a first annular fluid sealing means extending between said interior bore wall and said shaft at a vertical first level above said annular fluid grooves,

and a second annular fluid sealing means extending between said interior bore wall and said shaft at a vertical second level below said annular fluid grooves.

3,912,410

DEMOUNTABLE STRUCTURAL JOINT

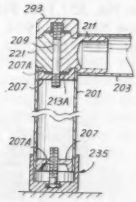
Giancarlo Pofferi, via Chilone 14, I-00124 Casalpalocco, Rome, Italy

Division of Ser. No. 302,403, Oct. 31, 1972. This application Dec. 31, 1974, Ser. No. 537,713

Claims priority, application Italy, Nov. 5, 1971, 9748/71

Int. Cl.² F16D *1/00, 3/00;* **F16B** *7/02*

U.S. Cl. 403—170 **13 Claims**



1. A structural joint comprising a tubular member, an end fitting axially disposed within the tubular member and projecting from one end thereof, concentric arcuate conically shaped grooves defined on opposite sides of the end fitting adjacent the end of the tubular member from which the end fitting projects, a support member disposed at an angle to the tubular member, the end of the support member forming a rim that engages one of the grooves of the end fitting, a cap disposed on the side of the end fitting opposite the support member, said cap having sidewalls that form a rim which engages a groove of the end fitting, and threaded stem means engaging the cap and the support member for forcing said rims against the grooves of the end fitting and thereby stiffening the joint.

3,912,411

THREAD LATCHING MECHANISM

Robert H. Moffat, 8554 Nevada, Canoga Park, Calif. 91304

Continuation-in-part of Ser. No. 182,768, Sept. 22, 1971, abandoned. This application Apr. 5, 1974, Ser. No. 458,212

Int. Cl.² F16D *1/06*

U.S. Cl. 403—259 **18 Claims**

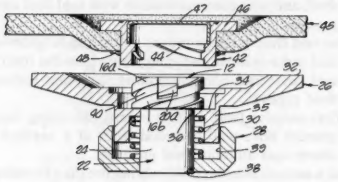
1. A thread latching mechanism comprising:

a. a first threaded member having a thread discontinuity;

b. a second member axially movable relative to said first member, said second member having a thread segment adapted to register with the thread discontinuity of said first member upon relative axial movement between said first and second members;

c. biasing means for yieldably resisting relative movement between said first and second members so as to hold the thread segment of said second member normally out of register with the thread discontinuity of said first member, said biasing means comprising:

1. a support means for supporting said first member, said support means having a central aperture therein



adapted to telescopically receive said second member;

2. a hub member affixed to said second member; and

3. a compression spring interposed between said support means and said hub member for urging relative separation therebetween; and

d. a third threaded member adapted to threadably engage said first threaded member.

3,912,412

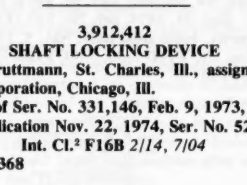
SHAFT LOCKING DEVICE

Hilarius S. Struttmann, St. Charles, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 331,146, Feb. 9, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,205

Int. Cl.² F16B *2/14, 7/04*

U.S. Cl. 403—368 **12 Claims**



1. A bearing having an inner race adapted to be locked to a shaft for rotation with the shaft comprising:

a member having a cylindrical inner race portion with a bore having an inside diameter to receive the shaft;

at least one portion extending axially outwardly from said race portion with an interior truncated conical surface diverging with respect to the axis of the race portion;

an axially split sleeve member receivable in said axially extending portion having an inner diameter to receive said shaft and adapted to be collapsed to wedge with said shaft;

said sleeve member having an exterior truncated conical surface complementary to the conical surface of said axially extending portion;

said conical surfaces having an angle with respect to the longitudinal axis of said shaft no greater than an angle whose tangent equals the coefficient of friction between the conical surfaces;

said sleeve member being movable axially with respect to said race portion to lock said surfaces with respect to one another, thus locking said cylindrical member and said sleeve member together, said sleeve member being collapsed to wedge with said shaft and thus locking said cylindrical member with said shaft for concurrent rotation therewith about a common axis.

3,912,413

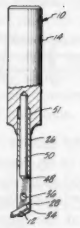
BORING BAR

Karl G. Werther, 1409 Hinnen Ave., Hacienda Heights, Calif. 91745

Continuation-in-part of Ser. No. 261,526, June 9, 1972, Pat. No. 3,841,785. This application Feb. 25, 1974, Ser. No. 445,441

Int. Cl.² B23B *29/02*

U.S. Cl. 408—143 **7 Claims**



1. A boring bar for mounting in a boring machine and adapted to carry a boring bit comprising a cylindrical body member having a forwardly axially extending portion, said forwardly axially extending portion having a longitudinal axis, a continuous end portion and a transverse channel extending therethrough, said channel being positioned adjacent to and enclosed by the continuous end portion of said forwardly extending portion and being adapted to hold said boring bit therein, a slot parallel to and extending through said forwardly extending portion and merging with said channel, a longitudinal chamber disposed rearwardly of said slot, a stiffening member being supported from said cylindrical body member and being disposed within said chamber for reducing vibration and means for compressing said forwardly extending portion about said slot thereby maintaining said bit within said channel, said means being positioned rearwardly of said channel along said forwardly extending portion.

3,912,414

CEMENTED CARBIDE TWIST DRILL

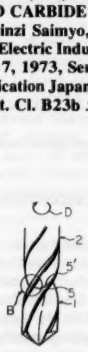
Hiroshi Fukura, and Sinzi Saimyo, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed June 7, 1973, Ser. No. 367,897

Claims priority, application Japan, June 9, 1972, 47-67290

Int. Cl. B23b *51/02*

U.S. Cl. 408—144 **4 Claims**



1. A cemented carbide twist drill comprising a steel twist drill body having two spiral grooves in 180° angular spaced relationship and lands and relieved peripheries between said spiral grooves in the periphery extending in the length of said drill, and a cemented carbide tip connected to the forward end of said body, the tip having corresponding spiral grooves,

lands and relieved peripheries respectively continuing those of the drill body, said drill body and tip being connected together between a V-section projection of said body defined by two planar converging faces diametrically extending across the diameter of said drill from one relieved periphery to the other relieved periphery and a mating V-section groove of said carbide tip defined by two planar converging faces diametrically extending across the diameter of said tip from one relieved periphery to the other relieved periphery at one end of the tip opposite to said projection of the drill body.

3,912,415

MOLECULAR PUMP AND METHOD THEREFOR

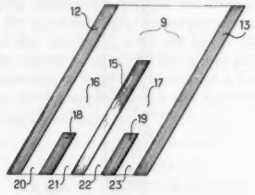
Louis Maurice, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Mar. 21, 1974, Ser. No. 453,498

Claims priority, application France, Mar. 21, 1973, 73.10183

Int. Cl. F04d *3/02*; **F01d** *1/36*

U.S. Cl. 415—72 **14 Claims**



1. A method for improving the operation of a high vacuum molecular pump of the multi-thread type comprising increasing the number of threads at a discharge portion of a multi-thread high vacuum molecular pump by forming at least one low wall between two successive threads, said at least one low wall being parallel to said two threads and being formed with a length shorter than the length of the groove between said two threads, thereby subdividing respective grooves formed between two successive threads into at least two additional channels at the discharge portion.

3,912,416

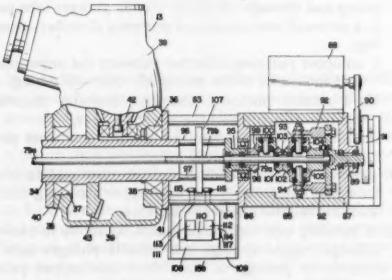
CONTROLLABLE PITCH PROPELLER AND DRIVE MEANS THEREFOR

William B. Herbert, 111 Yantacaw Brook Road, Upper Montclair, N.J. 07043

Division of Ser. No. 164,502, July 21, 1971. This application Jan. 28, 1974, Ser. No. 436,922

Int. Cl.² B63H *3/02*

U.S. Cl. 416—160 **8 Claims**



1. In a controllable pitch propeller, a hub having blades mounted thereon for rotation about axes extending radially to said hub, a pair of nuts mounted in said hub for slidable axial movement relatively to each other in said hub, means responsive to said axial movement for rotating said blades, a control screw extending axially through said nuts, said control screw having a threaded portion in threaded engagement with one of said nuts and an oppositely threaded portion in threaded engagement with the other of said nuts, an output shaft for driving said hub, means for rotating said screw independent of the RPM of said output shaft, a differential assembly for driving said screw rotating means at the same speed as said output shaft, and guide rod means interconnecting said output shaft and said differential.

3,912,417

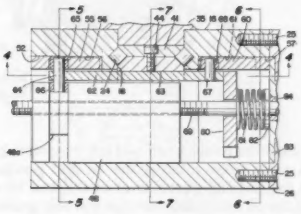
MECHANISM FOR CONTROLLING THE PITCH OF PROPELLER BLADES

William B. Herbert, 111 Yantacaw Brook Road, Upper Montclair, N.J. 07043

Filed Apr. 15, 1974, Ser. No. 461,256

Int. Cl.² B63H *3/02*

U.S. Cl. 416—167 **12 Claims**



1. In a controllable pitch propeller, a hub having an axial bore, a plurality of circumferentially-spaced bores extending from said axial bore through said hub and having their axes radial to said hub, propeller blades mounted in said radial bores and having blade roots adjacent the radially innermost ends of said radial bores, said blade roots having slots in their inner ends, pitch adjusting means within said axial bore, said means comprising a control screw, a nut movable axially of said axial bore by said screw, cam and lever means responsive to movement of said nut, for rotating said blades about their axes, said cam and lever means comprising levers movable substantially longitudinally in said blade root slots, and cam slots in fixed relation to said hub and effective upon longitudinal movement of said levers to cause the ends of the levers to traverse said cam slots and impart a rotative movement to the levers.

3,912,418

LUBRICATION SYSTEM FOR A ROTOR

Merritt B. Andrews, Westfield, Mass., and Philip E. Barnes, West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

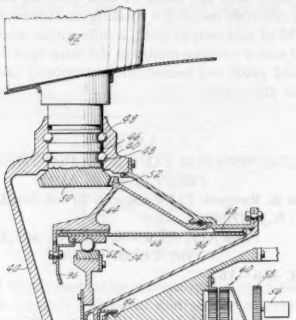
Filed Oct. 1, 1974, Ser. No. 510,932

Int. Cl.² B64C *11/36*

U.S. Cl. 416—174 **5 Claims**

1. A lubrication system for a rotor having a housing supporting variable pitch blades including a drive shaft driving said rotor, a pitch change actuator including elements having relative movement, support means for the blades including elements having relative movement and the drive shaft including elements having relative movement, all of said elements requiring lubrication and being disposed in said housing such that said support means, said pitch change actuator and said drive shaft are radially spaced from each other defining separate lubrication areas and all being supported in the cavity of said housing so that there is intercommunication between all of said areas so that oil can migrate from adjacent one set of elements to another set of elements when the rotor is in a

nonrotating condition, a chamber in said housing for receiving oil when said rotor is rotating, drain means communicating with said chamber to exit the excess oil from said chamber and establish a relative level of oil in said cavity when said rotor is nonrotating, and oil supply means for continuously feeding



oil to said chamber solely when said rotor is rotating, whereby when said rotor stops rotating the oil will gravitate to the bottom of the housing to the level established by said drain means and the oil from said chamber will also gravitate to the bottom to replenish any loss of oil.

3,912,419

HYDRAULIC PUMP CONTROL ARRANGEMENT

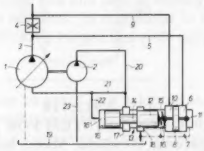
Gerhard Lutz, Faurndau, and Karl Reiff, Sersheim, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 25, 1971, Ser. No. 156,737

Claims priority, application Germany, July 3, 1970, 2033053

Int. Cl.² F04B *49/00*

U.S. Cl. 417—252 **10 Claims**



3. Hydraulic pump control arrangement comprising main pump means having a consumer conduit and an inlet conduit; a throttle in said consumer conduit producing a pressure differential upon operation of said main pump means; a filler pump having an outlet conduit connected with said inlet conduit for supplying at least as much fluid to said main pump means as the same can absorb; pressure limiting valve means including a spring means biasing said pressure limiting valve means to a closed position; a connecting conduit connecting said outlet conduit with said pressure limiting valve means so that the pressure of said fluid from said outlet conduit urges said pressure limiting valve means to an open position for discharging the fluid to a low pressure space; piston and cylinder means forming a high pressure chamber and a low pressure chamber connected to said consumer conduit upstream and downstream of said throttle, respectively, and including a movable member subjected to said pressure differential; and connecting means connecting said pressure limiting valve means with said movable member so that said pressure limiting valve means moves to said open position when said filler pump supplies more fluid to said main pump means than the same can absorb and the pressure in said outlet conduit increases while said pressure differential does not increase.

3,912,420

POSITIVE PULL-DOWN NON-POUNDING OIL WELL PUMP FOR USE WITH FLEXIBLE PUMPING STRAND

Robert H. Gault, Midland, Tex., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 19, 1974, Ser. No. 443,931

Int. Cl.² F04B *3/00*

U.S. Cl. 417—260 **1 Claim**

1. An improved long stroke positive pull-down oil well pump for use with flexible pumping strand comprising:

a. an extended pump barrel adapted for mounting at the bottom of a well tubing in an oil well,

b. a standing valve at the bottom of said pump barrel,

c. a plunger assembly reciprocally mounted in said pump barrel and comprised of

i. an upper plunger in sealing relation with the barrel of the pump,

ii. a lower plunger in sealing relation with the barrel of the pump,

iii. a middle plunger tube operatively connecting said upper and lower plungers,

d. a central plunger packing positioned in the barrel of said pump and through which the middle plunger tube passes,

e. a series of interconnected pumping chambers comprising:

i. an upper pumping chamber between the upper plunger and the outlet of the pump into the well tubing,

ii. a middle pumping chamber between the central plunger packing and the lower plunger,

iii. a lower pumping chamber between the lower plunger and the standing valve,

f. passage means extending through said middle plunger tube and interconnecting said upper pumping chamber and said middle pumping chamber,

g. a traveling one way valve means operative to close said passage means through said middle plunger tube with respect to passage of fluid from said upper pumping chamber to said middle pumping chamber but not from said middle pumping chamber to said upper pumping chamber,

h. a traveling one way valve means operative to close passage means through said lower plunger between said

middle pumping chamber and said lower pumping chamber with respect to passage of fluid from said middle pumping chamber to said lower pumping chamber but not with respect to liquid passing between said lower pumping chamber to said middle pumping chamber,

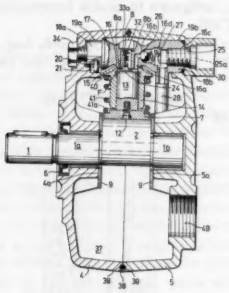
i. an upper chamber positioned below the said upper plunger and above the central plunger packing, said upper chamber having openings through the barrel of the pump for passage of fluid into and out of the upper chamber from the well,

said well pump being arranged and constructed such that on the upstroke of said pump the standing valve at the bottom of the pump will open and the upper traveling valve will open and during the downstroke of the pump the standing valve will close and the upper traveling valve will close while the lower traveling valve will be initially closed during the beginning of the pump downstroke and will then open as pressure builds up in the lower pumping chamber of the pump and external pressure is decreased in the middle pumping chamber as said chamber increases in size whereby the pump mechanism does not pound when the pump is operated at a rate such that the lower pumping chamber does not fill completely with well fluid during the upstroke of the lower plunger and prior to the beginning of the downstroke of the lower plunger and the closing of the standing valve and the lower plunger during its downward movement forceably contacts a free surface of a body of well fluid trapped above the standing valve in the lower pumping chamber.

3,912,421
RADIAL PISTON MACHINE

Robert Gelin, Blaustein, Germany, assignor to G. L. Rexroth GmbH, Lohr (Main), Germany

Filed June 18, 1974, Ser. No. 480,503
Claims priority, application Germany, June 29, 1973, 2333103
Int. Cl.² F04B *1/04, 19/02*
U.S. Cl. 417—273 **5 Claims**

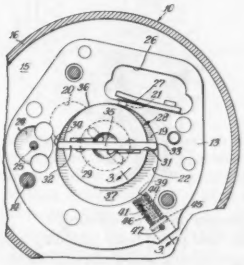


1. In a radial piston machine, a combination comprising a housing; a shaft having an eccentric portion and being rotatably mounted in said housing; a plurality of radially oriented pistons mounted within said housing and each having an inner end; a piston shoe connected to the inner end of each piston in sliding engagement with said eccentric portion of said shaft; a plurality of cylinder sleeves, each surrounding one of said pistons for free sliding movement relative thereto, each of said cylinder sleeves having a radially outer end; a stationary member for each of said cylinder sleeves and having an inwardly directed part-spherical surface, a portion of which being engaged and surrounded by the radially outer end of the respective cylinder sleeve; biasing means biasing each of said cylinder sleeves into engagement with said part-spherical surface; inlet and outlet valve means in each member at the respective portion of said part-spherical surface which is surrounded by said outer end of the respective cylinder sleeve, said inlet valve means comprising a valve member located within said cylinder sleeve and spring means connected to said valve member at the side thereof facing away from said cylinder sleeve for biasing the valve member into engagement with said stationary member.

3,912,422
LIQUID RELIEF VALVE IN CYLINDER FOR COMPRESSOR

Ludwig F. Funke, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 103,386, Jan. 4, 1971. This application Nov. 11, 1974, Ser. No. 522,325
Int. Cl.² F04B *49/00*
U.S. Cl. 417—310 **7 Claims**

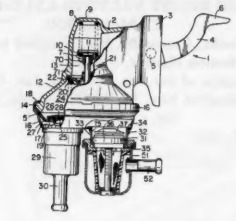


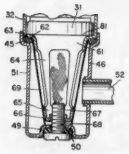
2. In a rotary compressor having a front head element, a rear head element, and a cylinder element cooperatively defining a cylindrical pressure chamber having a circumferential side wall, a suction inlet opening to said chamber, a discharge outlet opening from said chamber at a position spaced circumferentially of said chamber from said inlet, and a rotor rotatably mounted in said chamber and having a one piece blade extending diametrically through said rotor engaging substantially opposite portions of the chamber side wall, means for alleviating an incompressible fluid block condition of the compressor wherein liquid fills a portion of the chamber between the blade and a continuous portion of said chamber side wall free of said inlet and outlet openings, comprising: a relief passage opening from said chamber at said continuous portion of said chamber side wall; and check valve means permitting fluid flow only outwardly through said relief passage at a preselected high pressure above the normal maximum pressure of compressible fluid being compressed in said chamber by said compressor, whereby incompressible fluid trapped in said chamber portion is permitted to pass outwardly through said relief passage and compressible fluid compressed in said chamber portion is prevented from passing outwardly through said relief passage and caused to flow outwardly from said chamber through said outlet, said check valve means comprising a valve seat coaxially about said relief passage, a movable valve member seated on said seat and spring means in said relief passage biasing the movable valve member against said seat for closing the relief passage, and said relief passage comprising a bore in one of said elements opening to said chamber and an intersecting bore, said pressure alleviating means further including means for retaining the biasing means in said relief passage comprising a hole in said one element intersecting said relief passage, and a pin received in said hole and extending across said relief passage, said pin being captured in said hole by removable hole-end closing means.

3,912,423
DIAPHRAGM FUEL PUMP WITH FIELD SERVICEABLE GAS FILTER

Kort K. Pfabe, St. Louis, Mo., assignor to ACF Industries, Incorporated, St. Louis, Mo.

Filed Jan. 7, 1974, Ser. No. 430,365
Int. Cl. B01d *23/00;* **F04b** *19/00*
U.S. Cl. 417—313 **2 Claims**





1. A diaphragm pump comprising:

a pump body, said pump body including a pumping chamber; a diaphragm closing said pumping chamber;

means for reciprocating the diaphragm in response to a predetermined stimulus;

a formed casing attached to said pump body outboard of said diaphragm, said casing clamping at least a margin of said diaphragm between said casing and said pump body, said casing having an outlet cavity integrally formed therewith, said outlet cavity having an outlet check valve mounted therein, said casing also having an inlet cavity assembly removably mounted to a lip extending from said casing on the same side of said diaphragm as said outlet cavity, said lip including an inlet check valve mounted therein, said inlet cavity assembly including a dome structure and a disposable filter, means for removably mounting said inlet cavity assembly insertable through said dome and said disposable filter; and

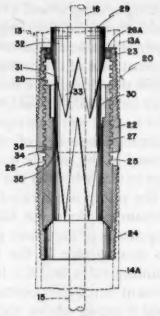
a plurality of ribs integrally formed and extending outwardly from said lip, said ribs having a free end defining a receptacle for receiving a threaded fastener, said fastening means comprising a threaded fastener, said disposable filter comprising a screen element slidably mounted over said ribs.

3,912,424
ROTATABLE CIRCULATING VALVE FOR SUBSURFACE OIL PUMPS

Clement Heidinger, P.O. Box 111, Lampman, Saskatchewan, Canada

Filed Apr. 25, 1974, Ser. No. 464,044
Int. Cl.² F04B *21/08;* **F16K** *31/53*
U.S. Cl. 417—434 **9 Claims**

1. A rotary valve assembly for use with submerged oil pump assemblies within a well casing, said pump assembly including a hollow tubing string within said well casing connected to said oil pump and extending to the surface, said tubing string and said well casing defining an annular space therebetween, a reciprocal sucker rod within said tubing string and a pump rod connected to the lower end of said sucker rod for operating said pump; said valve assembly comprising in combination a hollow valve body, including a wall, connected in series with said tubing string and adjacent to said pump, said body being apertured through said wall thereof to communicate the interior of said pump body with said annular space, a hollow valve element within said valve body movable from an aperture covering position to an apertured exposing position, and valve element actuating means connected to said means to actuate said pump, said valve element being normally in said aperture covering position, said valve element actuating means being

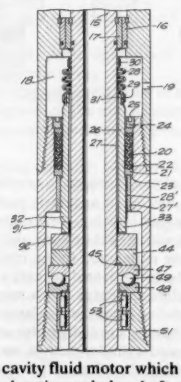


normally disengaged from said valve element, said valve element being screw threadably engageable within said valve body and means to engage and disengage said valve element actuating member with said valve element for rotating same in either direction within said valve body, thereby moving said valve element up and down said valve body from said aperture covering position to said aperture exposing position and vice-versa.

3,912,425
WEAR SLEEVES FOR SEALED BEARINGS

John E. Tschirky, and Gary Monroe Crase, both of Long Beach, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 388,586, Aug. 15, 1973, Pat. No. 3,879,094. This application Jan. 14, 1974, Ser. No. 433,284
Int. Cl.² F04C *1/06*
U.S. Cl. 418—48 **12 Claims**



11. A progressing cavity fluid motor which includes a rotor, a stator, and a stator housing, tubular shaft means connected to said rotor, a shaft housing for said shaft means, a fluid inlet into said stator and a fluid outlet from said stator, a fluid passageway from said stator outlet and into said tubular shaft means, radial and thrust bearings mounted in said shaft hous-

ing between said shaft housing and said shaft, the improvement which comprises a seal mounted in said shaft housing between said thrust bearings and said fluid outlet, a sleeve mounted at one end thereof on said shaft for rotation with said shaft, said seal positioned between said sleeve and said shaft, a flexible boot connected to the other end of said sleeve and to said shaft.

3,912,426

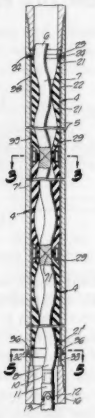
SEGMENTED STATOR FOR PROGRESSIVE CAVITY TRANSDUCER

John E. Tschirky, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 15, 1974, Ser. No. 433,540

Int. Cl.² F01C *5/04;* **F03C** *3/00*

U.S. Cl. 418—48 **22 Claims**



1. A progressing cavity fluid transducer assembly comprising a plurality of separate stator elements, said assembly having a vertical axis, an internal helical groove in the internal surface of said stator elements, said separate stator element having co-operating surfaces formed with at least one projection and recess with respect to a plane perpendicular to the said vertical axis to register said separate stator elements and means to connect the output end of one of said stator elements with the input end of a succeeding stator element in series into a continuous fluid passageway, a helical rotor element extending through said series of stator elements, a fluid flow connection to the first of said stator elements in said series, a fluid flow connection to the last of said stator elements in said series, the pitch of said stator groove (Ps) being twice the pitch of the rotor (Pr), and in which each of said rotor elements adapted to move in a rotary and eccentric motion in the stator elements.

3,912,427

HIGH PRESSURE GEAR PUMP

Otto Eckerle, and Robert Jung, both of Malsch, Germany, assignors to Otto Eckerle, Malsch, Germany

Filed Jan. 2, 1974, Ser. No. 430,158

Claims priority, application Germany, Jan. 5, 1973, 2300484

Int. Cl.² F04C *1/06, 15/00*

U.S. Cl. 418—71 **8 Claims**

1. A high pressure gear pump comprising in combination:

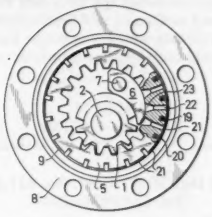
a pump housing including an inlet and an outlet for the pressure medium, a main bore, and at least one removable cover;

a pinion and a drive shaft solidary therewith, the shaft being journalled in the housing;

an internal gear ring cooperating with the pinion so as to be driven thereby, the gear ring fitting inside the housing main bore with a small circumferential annular gap, which gap permits the gear ring to shift its position in relation to the pinion in response to wear;

an arcuate filler wedge arranged between the pinion and the internal gear ring in the space outside their tooth engagement, the narrowing portion of the wedge extending toward the point of tooth engagement, and the filler wedge being adjustable radially against the pinion under contact pressure from the gear ring;

a plurality of radially open grooves with parallel flanks arranged in the peripheral portion of the internal gear ring at regular angular intervals;



sealing blades arranged in said grooves, each sealing blade being slidably engaged between the groove flanks for radial adjustment motion into sealing contact with the wall of the housing main bore; the sealing blades thus defining a succession of enclosed rotating compensation pressure field spaces in the annular gap between the internal gear ring and the main bore; and

a plurality of pressure feed channels linking the pumping pressure field which is created by the merging gear teeth with the annular gap in that portion of its circumference which is located radially outside the pumping pressure field, thereby pressurizing the rotating field spaces while they are moving through said circumference portion, so as to create a radially inwardly directed pressure compensation force on the internal gear ring in opposition to and greater than the radially outwardly directed thrust which is exerted on the gear ring by the pumping pressure field.

3,912,428

SHAFT SEAL

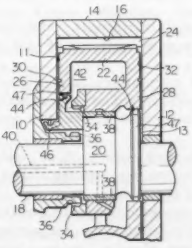
Ko Chiba, and Masayuki Maruyama, both of Kashiwazaki, Japan, assignors to Nissan Motor Company Limited, Yokohama and Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sept. 21, 1973, Ser. No. 399,362

Claims priority, application Japan, Sept. 22, 1972, 47-110818

Int. Cl.² F02B *55/02*

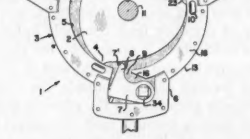
U.S. Cl. 418—104 **2 Claims**



1. A shaft seal to seal a clearance between relatively rotatable inner members, wherein said outer member has a bore

rotatably receiving said inner member and said inner member has two axially spaced end walls and a bottom wall defining a seal groove opening to said bore, said shaft seal comprising: a first compression ring in said seal groove biased radially outwardly into sealing engagement with said bore; and a second compression ring seal in said seal groove having a radially inward beveled section, said second compression ring being biased radially outwardly into abutting engagement with said bore and wherein said second compression ring seal is twisted about its circumference such that a radially outer edge of the first end surface of said second compression ring engages with said bore and a radially inner edge of the first end surface of said second compression ring engages with the axial end surface of said first compression ring thereby axially urging said first compression ring seal against the adjacent one of the end walls of said seal groove to effect sealing engagement, wherein said second compression ring sea has a first end surface adjacent to an axial end surface of said first compression ring and has a second end surface which is opposite from said first end surface and has said radially inward beveled section.

3,912,429
ROTARY ENGINE
Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212
Filed Dec. 3, 1973, Ser. No. 421,478
Int. Cl.² F03C *3/00*
U.S. Cl. 418—246 **9 Claims**



1. A rotary engine comprising:

a. a stator having a casing and opposite end walls, said casing and said end walls each having a respective inner surface positioned to define an inner cylinder, said casing having a plurality of circumferentially spaced ports therein;

b. a rotor rotatably mounted within the inner cylinder and having a peripheral cam surface with a plurality of circumferentially spaced lobes, the number of lobes being equal to the number of ports in said casing, said lobes each comprising a high of said rotor and providing a minor portion of the peripheral cam surface, said lobes each having a radius such that the high is freely rotatable in very close proximity to the inner surface of said casing to thereby define a plurality of chambers within the inner cylinder;

c. an elongated shaft operatively connect to said rotor and extending through at least one of said end walls of said stator;

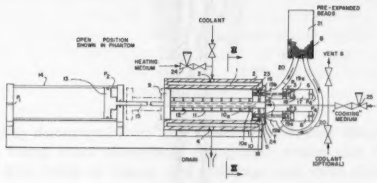
d. a plurality of circumferentially spaced valve housings mounted on said casing and each defining a valve chamber communicating with a respective one of said ports in said casing;

means communicating with each of said valve housings defining a respective inlet passage and an exhaust passage communicating therewith;

f. a plurality of valve members each positioned in a respective one of said valve housings, the number of valve members and number of valve housings being equal to the number of lobes on the rotor, said valve members each being movably mounted in the respective valve housing and having a chamber blocking portion in sealing engagement with the peripheral cam surface of said rotor, said valve members each being movable between a position closing said respective inlet passage and a position opening same for communication with the inner cylinder, said valve members each with all of the valve members having the same position relative to the respective inlet passage having a flow passage therethrough for exhaust flow from the inner cylinder to said respective exhaust passage; and

g. means communicating with each of said inlet passages for simultaneously supplying an expandable fuel to same.

3,912,430
APPARATUS FOR MOLDING BEADS EXPANDABLE AND FORMABLE UNDER HEAT AND PRESSURE
John A. Noel, 520 E. Medlock Drive, Phoenix, Ariz. 85012
Filed May 24, 1974, Ser. No. 473,100
Int. Cl.² B29C *1/14*; B29D *27/04*
U.S. Cl. 425—4 R **8 Claims**



1. Apparatus for molding beads expandable and formable under heat and pressure comprising a container for such beads, a first mold member which is hollow and open at one end and of uniform internal cross section along an axis perpendicular to the open end, a second mold member comprising a central element and end elements connected with the central element and spaced apart longitudinally of the central element, the external cross section of the end elements conforming to the uniform internal cross section of the first mold member so that when the second mold member is inserted into the first mold member through the open end of the first mold member a mold cavity is formed within the first mold member with the spaced apart end elements of the second mold member defining the ends of the mold cavity, means for conveying said beads from said container into the thus formed mold cavity, means for admitting to the mold cavity a medium for subjecting said beads to heat and pressure to form in the mold cavity a product having the finished final shape and size of the mold cavity and means for withdrawing the second mold member with said product from the first mold member through the open end thereof.

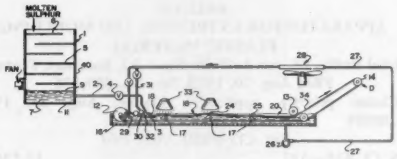
3,912,431
APPARATUS FOR THE SOLIDIFICATION OF MOLTEN SULPHUR
Ernest Ralph Ellithorpe, and Ronald Bruce Fletcher, both of Calgary, Canada, assignors to Vennard & Ellithorpe, Calgary, Canada
Division of Ser. No. 448,152, March 4, 1974, which is a division of Ser. No. 207,909, Dec. 14, 1971, Pat. No. 3,832,145. This application Dec. 23, 1974, Ser. No. 535,651
Claims priority, application Canada, Dec. 24, 1970, 101481
Int. Cl.² F28F *5/00*; B01D *9/00*; C01B *17/02*
U.S. Cl. 425—6 **8 Claims**

1. Apparatus for the solidification of molten sulphur comprising:

a. a movable endless substantially horizontal belt for supporting a layer of molten sulphur thereon;

b. means for feeding molten sulpur onto the normally upper surface of said movable belt at a first of a plurality of pools of molten sulfur;

c. a supporting structure disposed beneath the upper surface of said belt so as to define at least three undulations arranged in predetermined spaced relationship along the length of said belt, said undulations being such as to permit the formation of said plurality of separate and distinct pools of molten sulphur thereon;



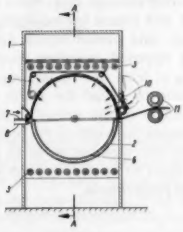
d. means for controlling and balancing the feed rate of said molten sulphur, the speed of said belt in relation to the angle and length of the inclination of the undulation which extends upwardly and away from said feeding section so that in continuous operation a constant level of molten sulphur in said pools is maintained;
e. means for delivering cooled sulphur from said belt and
f. means for providing a cooling bath of aqueous medium in contact with said surface.

3,912,432

BASE MATERIAL FOR SYNTHETIC LEATHER, AND APPARATUS FOR THE PRODUCTION THEREOF

Heinz Fleissner, Egelsbach, Germany, assignor to Vepa AG, Switzerland

Division of Ser. No. 14,808, Feb. 17, 1970, Pat. No. 3,876,745. This application Aug. 12, 1974, Ser. No. 496,896
Claims priority, application Germany, Feb. 17, 1969, 1907860
Int. Cl.² B29C *15/00*
U.S. Cl. 425—75 **7 Claims**



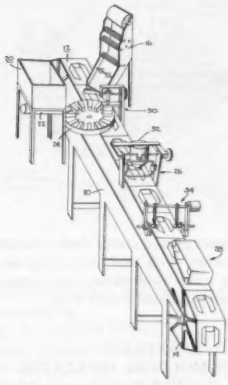
1. An apparatus for producing a dense stitched fleece which comprises a treatment chamber, at least one sieve drum means rotatably disposed in said treatment chamber for conveying the fleece therethrough, inlet means for introducing the fleece to be treated to the treatment chamber, fan means associated with the sieve drum means for subjecting the interior of said sieve drum means to a suction draft, heating means disposed in the circulation zone of the treatment chamber, pretensioned sieve means associated with at least a portion of the surface of the sieve drum means and in the proximity of the outlet to the treatment chamber for compressing the fleece therebetween, drive means for driving the fan means, drive means for rotating the sieve drum means and outlet means for removing the dense stitched fleece from the treatment chamber.

3,912,433

AUTOMATIC EGG ROLL MAKING MACHINE

Kwok Chuen Ma, 144 Hester St., New York, N.Y. 10013

Filed Oct. 26, 1973, Ser. No. 410,253
Int. Cl.² A23G *3/00*
U.S. Cl. 425—126 R **19 Claims**



1. Apparatus for automatically making egg rolls, comprising:
a folding assembly;
means for feeding an egg roll skin on to the top surface of the folding assembly;
a mold means included in said folding assembly and having a mold cavity with an opening facing a top folding surface upon which an egg roll skin rests, said mold means being adapted for receiving a portion of said egg roll skin and a food stuffing through said opening to substantially fill said mold cavity;
means included in said folding assembly for folding the two opposite sides of said egg roll skin over to the central portion of said egg roll skin adjacent said mold cavity;
means for activating said mold means from a first position to a second position whereby a portion of said egg roll skin lining the walls of said mold cavity and the food stuffing therein is folded over on to a remaining portion of said egg roll skin, thereby partially forming said egg roll;
means for applying a bonding agent to a portion of said egg roll skin; and
means for wrapping and the remaining unfolded portion of said egg roll skin to form a final egg roll product.

3,912,434

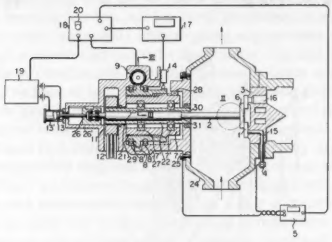
METHOD AND APPARATUS FOR ADJUSTING THE POSITION OF CUTTER BLADES RELATIVE TO A DIE IN A PLASTIC RESIN PELLETIZING APPARATUS

Masao Nagahara, Kamo; Masateru Tatsudan; Yoshihiro Hidaka, both of Aki, and Minoru Yoshida, Hiroshima, all of Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,166
Claims priority, application Japan, Jan. 8, 1974, 49-5091
Int. Cl.² B28B *17/00;* **A01J** *21/02*
U.S. Cl. 425—142 **5 Claims**

2. An apparatus for adjusting the position of cutter blades relative to a die in a plastic resin pelletizing apparatus comprising cutter blades resiliently secured to one end of a cutter shaft so as to be allowed relative axial movement thereto, means to rotate said cutter shaft, shifting means to shift said cutter shaft axially towards said die at a relatively slow speed, electrode means provided in said die to detect the contact of the cutting edges of said cutter blades with the surface of said die, signal transducer means to produce electrical signal

pulses upon said contact of the cutting edges of said cutter blades, measuring means to measure the axial movement of said cutter shaft upon receipt of said electrical signal pulses from said signal transducer means, and setting means to set a

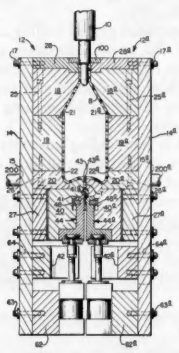


desired axial movement of said cutter shaft, said setting means being made to associate with said measuring means to stop said shifting means when said measuring means detect the desired axial movement of said cutter shaft.

3,912,435
BLOW MOLDING APPARATUS

Donald A. Waring, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed May 6, 1174, Ser. No. 467,262
Int. Cl.² B29C *1/00, 7/00*
U.S. Cl. 425—326 B **9 Claims**



1. An apparatus for blow molding hollow, plastic articles from tubular plastic parisons which includes:

a. a split blow mold having two halves and a center axis, each half having a top mold component and a bottom mold component, said bottom mold component being movable along said center axis;

b. two individual mold support means holding each individual mold half;

c. power means connected to each support means to move each individual support means and each associated mold half in a direction substantially perpendicular to said center axis whereby said split blow mold can be opened and closed;

d. tail-gripping means having two opposed halves, each half being held by one of said mold support means and said tail-gripping means being movable along the center axis of said article;

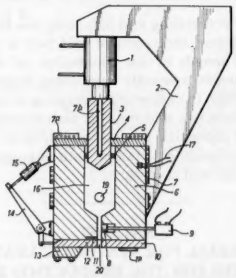
e. cooperating engaging means on said tail-gripping means and on said bottom mold component halves; and

f. second power means coupled to said tail-gripping means to first move said tail-gripping means along said center axis and subsequently to move said tail-gripping means into engagement with said bottom mold component halves to move said mold component halves along said center axis whereby a tail is removed from said article by said first movement and whereby said subsequent movement facilitates removal of said article from said mold halves when said mold is opened.

3,912,436
APPARATUS FOR EXTRUDING AND MOULDING PLASTIC MATERIAL

Michel Bailly, 28, rue du Point Haut -92, Suresnes, France

Filed Aug. 20, 1973, Ser. No. 389,556
Claims priority, application France, Aug. 23, 1972, 72.30059
Int. Cl.² B29D *7/02, 7/04*
U.S. Cl. 425—327 **14 Claims**



1. Apparatus for extruding and moulding a plastic material to form a shaped product, said apparatus comprising a vertical accumulation chamber, feed screw means for supplying plastic material to said chamber, an extrusion head coupled to said accumulation chamber and including means defining an extrusion orifice, vertically movable piston means extending into said accumulation chamber, means for reciprocally moving said piston vertically such that in the downstroke of the piston plastic material accumulated in said accumulation chamber is extruded downwardly through said orifice to form an extruded sheet of material, and means for moulding said sheet to form a shaped product, said means which defines the extrusion orifice including opposed members bounding said orifice, means supporting at least one of said members for displacement in a direction to adjust the width of said orifice and thereby the thickness of the extruded sheet, and means to progressively increase the width of the orifice during extrusion by displacing said one member so as to compensate for the tendency of the sheet to be non-uniform in thickness over its length due to slip phenomena.

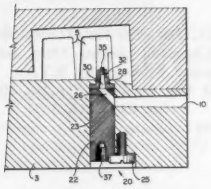
3,912,437
MOLD FILLING INSERT FOR INJECTION MOLDING MACHINE

Ladislav Hujik, Batawa, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed Oct. 29, 1974, Ser. No. 518,749
Claims priority, application Canada, Oct. 29, 1973, 184546
Int. Cl.² B29F *1/06;* **B29C** *11/00;* **B29H** *7/08*
U.S. Cl. 425—247 **4 Claims**

1. A mold filling insert for use in an injection molding machine in which a shoe heel is molded in a mold cavity defined by a mold having an injection port for injecting moldable material into said mold cavity, said mold filling insert comprising a nozzle contiguous to said injection port having an injection orifice inclined relative to the path normally followed through said injection port by an angle up to 90° to said path, said mold includes a top mold and a bottom mold defining said mold cavity, said insert including a body removably mounted

in said mold bottom intersecting said injection port, a flow passage in said body connecting said injection port to said mold cavity, said nozzle mounted on said body projecting into



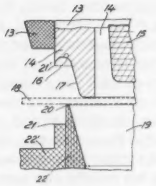
said mold cavity, and a passage in said nozzle defining said injection orifice for feeding moldable material from said flow passage into said mold cavity.

3,912,438

CONTAINER MANUFACTURING APPARATUS

Pietro Padovani, 2, Lungadige Matteotti, Verona, Italy

Division of Ser. No. 223,945, Feb. 7, 1972, Pat. No. 3,825,166.
This application Feb. 5, 1974, Ser. No. 439,834
Claims priority, application Italy, Feb. 13, 1971, 84912/71
Int. Cl.² B29C *17/08*
U.S. Cl. 425—292 **4 Claims**



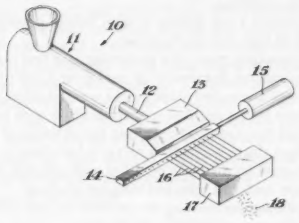
1. Apparatus for moulding an encircling lip on a thermoplastic upper wall edge defining a top opening of a container, comprising a lower mould part having an upper edge and arranged to abut on the outer surface of the upper wall region of said container, an upper mould part displaceable in an axial direction with respect to said lower mould part, arranged to be displaceable so as to abut on the inside surface of the upper wall region of said container for squeezing material from the upper wall region of said container upwardly beyond said upper edge of said lower mould part, and defining an inverted open recess overlapping said lower mould part and extending around said upper edge thereof for guiding the squeezed material around and downwardly beyond said upper edge of said lower mould part, a normally stationary cutter with a cutting edge located on the outer surface of said lower mould part at an elevation lower than and situated outwardly beyond said upper edge thereof, and an axially displaceable cutter located on an outer rim of said upper mould part and also having a cutting edge, the cutting edge of said stationary cutter and the outer rim of said upper mould part in the position of closest proximity to each other forming a cutting opening the height of which is greater than the thickness of the sheet material from which said container is made.

3,912,439

STRAND EXTRUSION APPARATUS

Ritchey O. Newman, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1974, Ser. No. 520,770
Int. Cl.² B29C *17/14*; **B29F** *1/022*
U.S. Cl. 425—308 **4 Claims**



1. A polymer extrusion apparatus, the polymer extrusion apparatus comprising

a housing, the housing defining

an extrusion passageway, the extrusion passageway having an inlet and

an outlet end, the outlet end having

an elongate slotlike configuration,

a die plate affixed to the housing, the die plate having

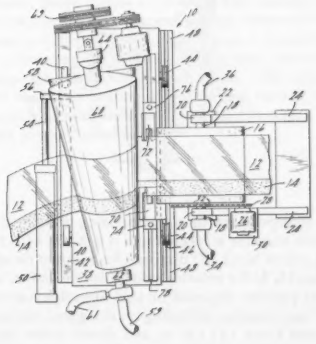
a plurality of extrusion orifices disposed therein, at least a portion of the orifices being in communication with the outlet end of the extrusion passageway, the die plate being slidably positioned on the housing so as to selectively position the extrusion orifices in register with the outlet end of the passageway and selectively position other extrusion orifices remote from the housing where they are accessible for cleaning.

3,912,440

APPARATUS TO EXPAND A LAMINATING INTERLAYER

George A. Koss, Dearborn Heights; Daniel J. Gurta, Westland, and Paul E. Tomshany, Dexter, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1974, Ser. No. 523,089
Int. Cl.² B29C *17/00*; **B29D** *7/24*
U.S. Cl. 425—335 **3 Claims**



1. An apparatus for expanding a continuous length of material so that originally parallel and straight lateral edges thereof are stretched to curved configurations of different arc lengths, which apparatus comprises:

a heat drum in the form of a cylinder;

first structure means for mounting said heat drum for rotation about its cylindrical axis;

heating means for supplying heat internally of said head drum;

first motor means for driving said heat drum so that said heat drum pulls said material from a continuous supply thereof and over a substantial portion of its cylindrical surface to heat the same to a temperature whereat it is a pliable condition;

a first cooling cone having a slant height greater than the width of said web of material;

second structure means for mounting said first cooling cone at a particular distance from said heat drum in a position such that a selected slant height position along said cooling cone is in a parallel spaced position with respect to a selected tangent position along the cylindrical surface of said heat drum whereby a rectangular plane is defined in said particular distance between said selected slant height position and said selected tangent position;

cooling means for cooling the interior of said cooling cone;

second motor means for driving said cooling cone;

drive means operative from said second motor means for driving said cooling cone means to apply a stretching force to said material between said head drum and said cooling cone, the portion of said web engaging the larger end of said cooling cone being stretched to a greater degree than the portion of said web material engaging the smaller end of said cooling cone, said web material leaving said heat drum at said selected tangent position, being subjected to stretching stresses and relieving of such stresses during movement across said particular distance and contacting said cooling cone at said selected slant height position, said particular distance being sufficient to permit a stretching of said material without otherwise changing its physical properties.

3,912,441

COMPRESSING ROLL IN ROTARY POWER COMPRESSION MOLDING MACHINE

Yasuo Shimada, and Giichiro Kowada, both of 104, Minamikamiai Nishinokyo, Nakakyo, Kyoto, Japan

Continuation of Ser. No. 314,851, Dec. 13, 1972, abandoned. This application Jan. 8, 1974, Ser. No. 431,836

Int. Cl. B29c *3/00*

U.S. Cl. 425—348 **3 Claims**

1. The improvement in a compressing roll for a powder compression machine wherein there is a shaft (**4**), a turntable (**1**) with a punch block (**2**) disposed for rotation on said shaft, drive means (**5, 6**) for rotating said turntable and, at least first and second punches disposed on said turntable outward from said shaft said punches including an elongated member journaled in said block (**2**) for up and down stroke movement parallel to said shaft (**4**) die means (**9**) engaged by said punch in said down stroke movement, a head (**17**) on said punch and a circular guide rail (**18**) disposed at an angle to said shaft to engage said head (**17**) raising and lowering said punch as said head travels along said guide rail, said improvement in said compressing roll comprising having said compressing roll (**10**) disposed to tangentially engage said head (**17**) as said punch reaches said rail lowering position said compressing roll (**10**) having a peripheral surface (**13**) with elastic means thereon, said elastic means prolonging the tangential period of contact between said compressing roll and said head (**17**).

3,912,442

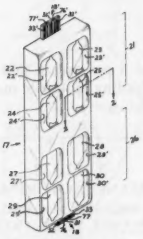
CONNECTOR FOR PHOTOFLASH ARRAY

Paul T. Cote, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,316

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 **8 Claims**



7. A circuit board for a planar flash array comprising an elongated circuit board member having first and second integral tabs respectively at the ends thereof, a first group of pairs of flash lamp connection areas carried on said circuit board on a first half thereof that is nearest said first connector tab, a second group of pairs of flash lamp connection areas carried on said circuit board on a second half thereof that is nearest said second connector tab, three circuit runs carried on said circuit board, one end of the circuit runs forming first, second, and third connector terminals arranged in a row in the named order across said first tab and the other end of the circuit runs forming first, second, and third connector terminals arranged in a row in the reverse of the named order across said second tab, the circuit run forming said second terminals being connected electrically with one lamp connection area of each pair thereof, switching circuitry connecting the second circuit run with the remaining lamp connection areas of said second group of lamps, and switching circuitry connecting the third circuit run with the remaining lamp connection areas of said first group of lamps, each of said tabs being provided with first and second deformations respectively between the first and second and the second and third terminals of the tab and which are shaped to increase the electrical paths between the respective first and second and the second and third terminals.

3,912,443

RADIANT GAS BURNERS

Frank Ernest George Ravault, and Bryan William Edwards, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

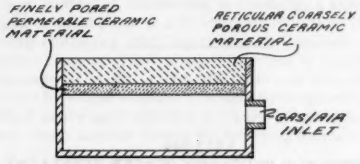
Filed Aug. 28, 1973, Ser. No. 392,352

Int. Cl.² F23D *13/12*

U.S. Cl. 431—328 **4 Claims**

1. A radiant gas heater including a radiant surface element consisting essentially of an inner gas distributing layer and an outer radiating layer of coarser structure than the inner layer,

the inner layer being formed of finely pored highly permeable ceramic material of apparent porosity 70 – 95% and the outer



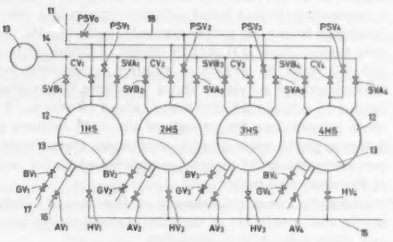
layer of reticular porous ceramic material of pore count 2 – 12 pores per linear cm and apparent porosity 90 – 99%.

3,912,444

METHOD FOR OPERATING HOT BLAST STOVE

Yoshio Ono, Kure; Minoru Kosugi, Kita-Kyushu; Okihiko Kan, Kawasaki, and Mitsuru Ohde, Hirakata, all of Japan, assignors to Nisshin Seiko Kabushiki Kaisha; Shin-Nippon Seitetsu Kabushiki Kaisha; Fuji Denki Seizo Kabushiki Kaisha, Kawasaki and Kuboto Tekko Kabushiki Kaisha, Osaka, all of, Japan

Filed June 6, 1974, Ser. No. 477,161
Int. Cl.² F24H 7/00
U.S. Cl. 432—30 **1 Claim**



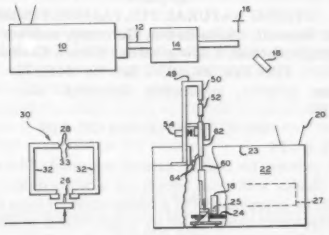
1. A method of operating a system of hot blast stoves for a blast furnace which system is made up of a plurality of hot blast stoves each having a cold blast valve, a pressure supply valve, a flue valve and a hot blast valve, the system further having a cold blast main pipe to which the cold blast valves of all of the stoves are connected, a cold blast branch pipe branching from said cold blast main pipe with a branch pipe pressure supply valve therebetween and to which all of the pressure supply valves are connected, a stack to which all of the flue valves are connected, and a hot blast pipe to which all of the hot blast valves are connected, said method comprising supplying combustion fuel to at least one of the stoves for heating it in an on blast operation while keeping the cold blast valve, pressure supply valve and hot blast valve to the one stove closed and leaving the flue valve open, while at the same time operating at least one other stove in an on regeneration operation by keeping the cold blast valve and the hot blast valve open and the flue valve and the pressure supply valve closed, thereby to pass cold gas through the said other stove to heat it, and then switching over the operation of the one stove to an on regeneration operation and the other stove to and on blast operation by first closing the cold blast valve and the hot blast valve of said other stove, and opening the pressure supply valve thereof while closing the branch pipe pressure supply valve, and at the same time closing the flue valve and ending the fuel supply to the other stove and opening only the pressure supply valve thereof for admitting the hot gas from the other stove to the one stove through the cold blast branch pipe, and thereafter closing the pressure supply valve of the said other stove and opening the flue valve thereof and starting supply of fuel thereto, while closing the pressure supply valve of the one stove opening the cold blast valve and the hot blast valve thereof.

3,912,445

MECHANISM FOR INSERTING HEATER IN PARISON WHICH MOVES IN ARCUATE PATH

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1974, Ser. No. 454,273
Int. Cl.² F27B 9/14
U.S. Cl. 432—123 **9 Claims**



1. Apparatus for heating a tubular parison comprising in combination: means for carrying a vertically disposed open end thermoplastic parison through a course in a heating oven and near a final portion of said course through an arcuate path; heating means adapted to be inserted into a top end of said parison; guide means to position said heating means in said parison; means to lower said heating means into said top end of said parison as said parison is near a beginning of said arcuate movement; means to move said thus lowered heating means through said arcuate path along with said parison; means to raise said heating means as said parison is near an end of said arcuate movement; and means to return said heating means to its original position.

3,912,446
COMPOSITION FOR TINTING, LIGHTENING AND SETTING HAIR

Charles Zviak, Franconville, and Giuliana Ghilardi, Paris, both of France, assignors to Societe Anonyme dite L'Oreal, Paris, France

Continuation-in-part of Ser. No. 195,868, Nov. 4, 1971, abandoned, which is a continuation of Ser. No. 791,780, Jan. 16, 1969, abandoned. This application Dec. 4, 1973, Ser. No. 421,670

Claims priority, application France, Jan. 19, 1968, 68.136698

Int. Cl.² A61K *7/13*, *7/11*, *7/135*

U.S. Cl. 8—10.1 9 Claims

1. A stable composition for tinting, lightening and setting hair comprising a solution in a solvent selected from the group consisting of water and an aqueous solution of a lower alkanol of an effective amount of hydrogen peroxide to lighten the hair, an effective amount of a water soluble 1:2 chromium complex of a mono azo dye to tint the hair and an effective amount of a cosmetic film-forming polymer which is soluble in said composition to set the hair, said cosmetic film-forming polymer being selected from the group consisting of polyvinylpyrrolidona having a molecular weight of about 20,000 – 150,000 and a copolymer of vinyl acetate and vinyl–pyrrolidone wherein the ratio of VA/VP ranges between about 30 – 50:70 – 50 and having a molecular weight of about 10,000 – 150,000, said composition having a pH between 1.5 and 4.5.

3,912,447
DYEING NATURAL POLYAMIDE FIBERS

Oswald Schmidt, Baden-Baden, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 28, 1974, Ser. No. 446,675

Claims priority, application Germany, Mar. 7, 1973, 2311130

Int. Cl.² D06P *3/16*, *1/06*, *3/06*

U.S. Cl. 8—19 9 Claims

1. A process for dyeing natural polyamide fibers brilliant pastel shades with dyes which are absorbed from an acid medium by impregnation at a temperature of from 0° to 50°C with from 70 to 130 percent by weight based on the fibers to be dyed of a dye liquor which contains from 0.15 to 7 percent by weight, also based on the fibers to be dyed, of hydrogen peroxide or an equivalent amount of performic acid and allowing the impregnated material to dwell at from 0° to 50°C while preventing drying until the dye has been fixed and then rinsing and drying the same.

3,912,448
PROCESS OF FELLMONGERING ANIMAL SKINS WITH A DEPILATORY COMPOSITION

James Henry Howe, Manly, Australia, assignor to Global Wool Investments Limited, Hong Kong, Hong Kong

Division of Ser. No. 236,592, March 21, 1972, Pat. No. 3,860,530. This application May 17, 1974, Ser. No. 471,095

Claims priority, application Australia, Mar. 29, 1971, 415157

Int. Cl.² C14C *1/06*

U.S. Cl. 8—94.16 6 Claims

1. A process for fellmongerng animal skins which comprises applying to the flesh side of said skins a depilatory composition which consists essentially of a reaction product of from 53 to 84% by weight of one or more lower aliphatic carboxylic acids and/or the anhydrides thereof and from 16 to 47% by weight of a lower alkanolamine, said composition being substantially non-aqueous and having a pH composition being substantially non-aqueous and having a pH within the range of 3.5 to 4.8 when in aqueous solution; maintaining said skins at a temperature of from 80° to 105°F. in an atmosphere of from 95 to 100% relative humidity until the fibers on said skins are loosened, and then removing said fibers from the skins.

3,912,449
PROCESS FOR PREPARING WATER REPELLENT COTTON TEXTILES AND THE PRODUCT

Trinidad Mares, 6416 Cummins St., Metairie, La. 70003, and Jett C. Arthur, Jr., 3013 Ridgeway Drive, Metairie, La. 70002

Filed Jan. 31, 1973, Ser. No. 328,198

Int. Cl. D06m *13/00*

U.S. Cl. 8—120 2 Claims

1. A process for imparting to cotton and other cellulosic textiles the desirable property of water repellency, while retaining the desirable natural properties of cotton and other cellulosic textiles, by preparation of cotton-poly(hexafluoroisopropyl acrylate) copolymer printcloth or sateen fabrics, the process comprising:

a. drying the cellulosic textile to a moisture content of about 0.5%,

b. irradiating the dry cellulosic textile with a radioactitive source, in an inert atmosphere, to a dosage of 1 megarad,

c. immersing the irradiated cellulosic textile in a solution computed to contain proportionately, including the cellulosic textile, about 1.0 part by weight of cellulosic textile and 6.0 parts by weight of solution, containing hexafluoroisopropyl acrylate (about 9 volume-%), methanol (about 73 volume-%), and water (about 18 volume-%) at room temperature for periods of about 15 minutes to 8 hours to give a polymer add-on of about from 11 weight percent to about 58 weight percent based on the weight of the untreated textile, and

d. washing the unreacted material off the treated cellulosic textile with a solution of methanol (about 80 volume-%) and water (about 20 volume-%),

e. drying the treated and washed cellulosic textile.

3,912,450
METHOD FOR SYNERGISTIC DISINFECTION OR STERILIZATION

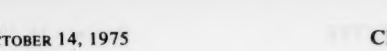
Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems, Inc., New York, N.Y.

Division of Ser. No. 155,233, June 21, 1971. This application May 17, 1973, Ser. No. 361,148

Int. Cl. A61l *13/00*, *1/00*

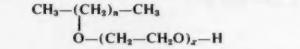
U.S. Cl. 21—54 A 7 Claims

1. A method for disinfecting or sterilizing medical, dental, surgical instruments or other objects in liquid phase at a temperature of at least 15°C comprising contacting said object with a sporicidal composition comprising from about 0.1 percent by weight to about 5 percent by weight of glutaraldehyde and from about 0.01 percent by weight to about 1 percent by weight of a nonionic surface active agent which is a mixture of ethoxylates of isomeric linear alcohols having the following formula:



wherein n is 9 to 13 and x is 9 to 13.

3. A method of disinfecting or sterilizing a contaminated object in liquid phase at a temperature of at least 15°C, comprising contacting said object with an aqueous sporicidal solution comprising from about 0.1 percent by weight to about 5 percent by weight of glutaraldehyde and from about 0.01 percent by weight to about 1 percent by weight of a nonionic surface active agent which is a mixture of ethoxylates of isomeric linear alcohols having the following formula:



wherein n is 9 to 13 and x is 9 to 13, while simultaneously subjecting said solution to sonic or ultrasonic fields having a frequency of from about 10 kHz to about 850 kHz and an acoustic energy density of about 1 watt per liter to about 5 watts per cubic centimeter inside the irradiated liquid phase.

3,912,451
METHOD FOR REMOVING HYDROGEN PEROXIDE FROM SOFT CONTACT LENSES

Charles A. Gaglia, Jr., Flanders, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

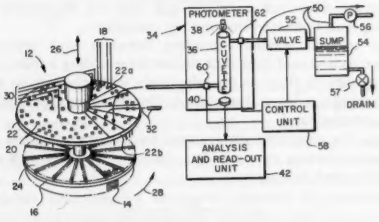
Continuation-in-part of Ser. No. 366,809, June 4, 1973, abandoned. This application Mar. 26, 1974, Ser. No. 454,141
Int. Cl.² A61L *13/00*; **G02C** *13/00*
U.S. Cl. 21—58 **24 Claims**

1. A method for removing hydrogen peroxide from a soft contact lens treated with hydrogen peroxide to effect sterilization which comprises contacting said lens with an aqueous system containing a catalytic amount of a hydrogen peroxide decomposition catalyst.

3,912,452
METHOD AND APPARATUS FOR PHOTOMETRIC ANALYSIS OF LIQUID SAMPLES

Lester A. Sodickson, Newton, and Stanley P. Mickiewicz, Medfield, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Dec. 13, 1973, Ser. No. 424,297
Int. Cl. G01n *21/26*, *33/16*
U.S. Cl. 23—230 R **19 Claims**



1. In photometric analysis apparatus for plural liquid samples received in succession and each normally having a volume in excess of a minimal value, and having a fluid passage which successively includes inlet conduit means, an analysis cuvette, and outlet conduit means, the improvement comprising

A. a first sensor coupled with the inlet conduit means and producing a first signal responsive to a selected parameter of fluid therein,

B. a first volumetric capacity, in said fluid passage between the coupling of said sensor with said inlet conduit means and the juncture of said cuvette with said outlet conduit means, less than such minimal sample volume, and

C. measuring means for photometrically measuring sample liquid in said cuvette, said measuring means being connected with said sensor and being conditioned to effect such measurement in response to the signal which said sensor produces upon the passage thereby of a trailing sample liquid-gas interface.

3,912,453
METHOD OF DETERMINING THE ALKALI METAL HYDROXIDE CONCENTRATION IN AN AQUA-AMMONIA-CHROMATE SOLUTION FOR USE IN AN ABSORPTION REFRIGERATION SYSTEM

Edward M. Greeley, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 3, 1974, Ser. No. 475,740
Int. Cl.² G01N *31/16*
U.S. Cl. 23—230 R **3 Claims**

1. A method which is readily adapted for use by a serviceman at the machine site, of determining the alkali metal hydroxide concentration of the solution in an absorption refrigeration machine having an aqua ammonia solution therein, which comprises the steps of:

withdrawing a sample of the solution from the absorption refrigeration machine;

mixing together a measured quantity of the withdrawn solution with an acid indicator and with a quantity of formaldehyde which is at least sufficient for the formaldehyde to mask the presence of the ammonium ion present in the solution;

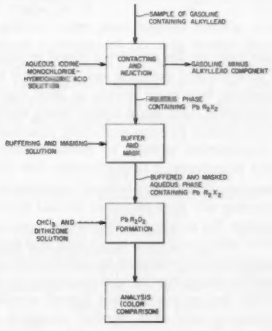
titrating the mixture with an acid of known concentration until the acid indicator indicates that the solution is neutralized, to determine the quantity of acid required to neutralize the mixture; and

calculating the alkali metal hydroxide concentration of the solution from the quantity of acid determined to be required to neutralize the mixture.

3,912,454
DETERMINATION OF ANTIKNOCK COMPOUNDS IN GASOLINE

Louis J. Snyder, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed June 24, 1974, Ser. No. 481,967
Int. Cl.² G01N *31/22*, *33/22*
U.S. Cl. 23—230 R **13 Claims**


SAMPLE OF GASOLINE CONTAINING ALKYLLEAD
AQUEOUS IODINE MONOCHLORIDE-HYDROCHLORIC ACID SOLUTION
CONTACTING AND REACTION
GASOLINE MINUS ALKYLLEAD COMPONENT
AQUEOUS PHASE CONTAINING $Pb\,R_2X_2$
BUFFERING AND MASKING SOLUTION
BUFFER AND MASK
BUFFERED AND MASKED AQUEOUS PHASE CONTAINING $Pb\,R_2X_2$
$CHCl_3$ AND DITHIZONE SOLUTION
$Pb\,R_2D_2$ FORMATION
ANALYSIS (COLOR COMPARISON)

1. A process for the determination of the concentration of lead as alkyllead in gasoline which comprises:

a. contacting the gasoline with an aqueous iodine monochloride-hydrochloric acid solution to convert the alkyllead to lead dialkyl dihalide in the aqueous solution, in

which the halogen constituent is either chlorine, iodine or a mixture thereof;

b. separating the aqueous solution from the contacted gasoline;

c. treating the aqueous solution with a buffering and masking solution which contains,

i. alkali metal sulfite,

ii. dialkali metal ethylenediaminetetraacetate,

iii. an alkylenepolyamine, alkali metal cyanide or a mixture thereof,

iv. a base, and

v. citrates, acetates or tartrates of ammonium or alkali metal or mixtures of such compounds;

d. contacting the treated aqueous solution with a solution of inert colorless dithizone solvent, which is immiscible in water, and dithizone to convert the lead dialkyl dihalide to lead dialkyl dithizonate in the solvent phase; and

e. determining, by comparing the color of the solvent phase with standardized colors or by measuring the color intensity of the solvent phase, the concentration of lead as alkyllead present in the gasoline.

3,912,455

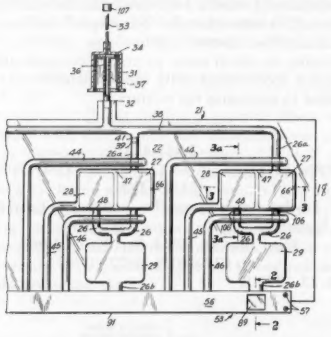
APPARATUS FOR CLINICAL LABORATORY SAMPLE COLLECTION AND AUTOMATIC SAMPLE PROCESSING

Eric S. Lichtenstein, 24 E. 93rd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 108,118, Jan. 20, 1971, Pat. No. 3,774,762, and Ser. No. 157,942, June 29, 1971, abandoned. This application Sept. 7, 1973, Ser. No. 395,214

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—253 R **26 Claims**



1. A disposable device for receiving blood or other fluid and physiological samples and carrying out diagnostic tests on said samples, comprising two main sheets, at least one of which is of thin flexible plastic, said main sheets being sealed together in a distribution system pattern including junction means for joining said distribution system to blood-taking means for receiving blood therefrom, a first chamber for receiving and holding a blood sample or fluid derived from said blood, a first channel connecting said first chamber to said junction means, a second chamber for holding a diagnostic test reagent, said second chamber incorporating a breakable seal through which said test reagent may be released by application of pressure, pressure means for breaking the seal on said second chamber, a third chamber for receiving said blood sample and said reagent on breaking said seal, further channels connecting said first and said second chambers with said third chamber and first valve means for controlling the flow of blood or fluid from said first chamber to said third chamber, said valve means comprising at least a third sheet of flexible plastic sealed to one of said two main sheets to form a pressurizable valve passage crossing said channel connecting said first and third chambers, whereby pressurizing said pressurizable valve passage results in closure of said channel connecting said first and third chambers.

3,912,456

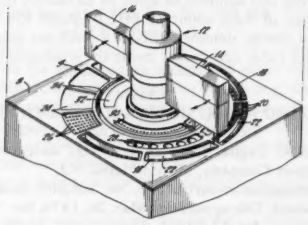
APPARATUS AND METHOD FOR AUTOMATIC CHEMICAL ANALYSIS

Robert R. Young, Anaheim, Calif., assignor to Anatronics Corporation, Anaheim, Calif.

Filed Mar. 4, 1974, Ser. No. 447,958

Int. Cl.[2] G01N *33/16, 1/14*

U.S. Cl. 23—253 R **26 Claims**



1. Apparatus for chemically analyzing a plurality of individual fluid specimens comprising:

a center support assembly;

means for supporting a plurality of randomly positioned specimen tubes spaced outwardly from the center support assembly;

a plurality of mixing containers spaced outwardly from the support assembly;

aspirator means rotatably mounted on and extending outwardly from said center support assembly including means selectively movable into and out of said specimen tubes to extract fluid from the tubes;

dispenser means rotatably mounted on and extending outwardly from said center support assembly including means selectively movable into and out of position to dispense fluid into said mixing containers;

fluid transfer means extending between said aspirator means and said dispenser means for enabling a measured quantity of fluid to be selectively withdrawn from said specimen tubes and selectively dispensed into said mixing container; and

means for automatically rotation said aspirator means and said dispenser means to be aligned selectively with said tubes and containers.

3,912,457

TEST STRIP FOR HEPATIC DISEASES

Yasunao Ogawa, Ikeda; Yukio Yonetani, Nara; Hideyuki Maekawa, Osaka, and Kaoru Ishitobi, Yao, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed June 21, 1974, Ser. No. 481,911

Claims priority, application Japan, Mar. 15, 1974, 49-30389

Int. Cl.[2] G01N *31/22, 33/16*

U.S. Cl. 23—253 TP **5 Claims**

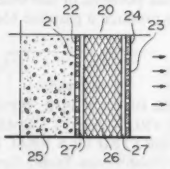
1. A test strip for the detection of bilirubin, comprising an absorbing material, an organic sulfonic acid or salts thereof and a ferric salt.

3,912,458

AIR BAG GAS GENERATOR CASING

Daizo Fukuma, Tokorozawa, and Kensho Shirota, Kodaira, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 17, 1973, Ser. No. 425,533
Claims priority, application Japan, Dec. 26, 1972, 47-48717
Int. Cl.² B01J 7/00; B60R 21/08
U.S. Cl. 23—281 8 Claims



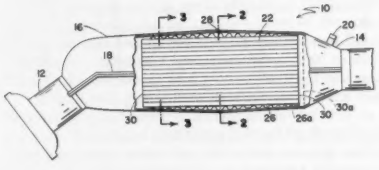
1. In a gas generator casing for an air bag safety device of a vehicle, comprising a generally cylindrical inner wall member having a plurality of holes formed therethrough, a generally cylindrical outer wall member coaxially disposed about said inner wall member and having a plurality of holes formed therethrough, said inner and outer walls being commonly sealed at both ends, a generally rigid porous member made of an unglazed substance disposed between said inner and outer wall members to cool and filter gas passing therethrough generated by a gas generating element disposed within said inner wall member.

3,912,459

CATALYTIC CONVERTER

Walter H. Kearsley, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Dec. 13, 1972, Ser. No. 314,511
Int. Cl.² B01J 35/04; F01N 3/15; B01J 8/00
U.S. Cl. 23—288 FC 2 Claims



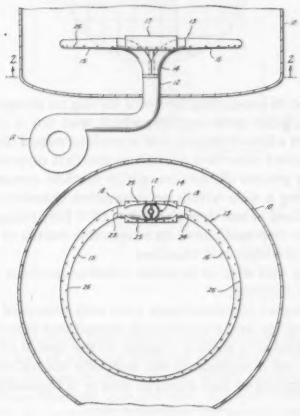
1. In a catalytic converter for exhaust gases of the type having a casing with an internal wall surface and gas inlet and outlet openings at its respective ends, a fragile housing interior to said casing in the line of exhaust gas flow having exhaust gas passages extending longitudinally between and in communication with said inlet and outlet openings and containing catalyst material, said housing having an exterior longitudinal wall surface and being longitudinally movable with respect to said casing, a resilient support media between and engaging the exterior longitudinal wall surface of said housing and the interior wall surface of said casing to support said housing within said casing and limit relative movement therebetween, the improvement comprising the exterior wall surface of said housing and the opposing interior wall surface of said casing sloping relative to each other in one direction along one longitudinal portion of said converter, and in the opposite direction along another portion of said converter to form therebetween an annular opening having oppositely tapered portions, said support media being lodged in compression in said annular opening, between and in contact with said sloping interior and exterior wall surfaces, said relatively sloping walls and said tapered opening therebetween extending along a substantial longitudinal portion of said housing, whereby a portion of said support media is subjected to increased compression when said housing is moved in a longitudinal direction relative to said casing, thereby tending to arrest longitudinal movement of said housing relative to said casing.

3,912,460

METHOD AND ARTICLE FOR DISTRIBUTING AIR IN A REGENERATOR

Rodney McGann, Northridge, Calif., assignor to Texaco Development Corporation, New York, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,166
Int. Cl.² B21K 21/08; B01J 8/24
U.S. Cl. 23—288 B 13 Claims



6. An air distribution system for a regenerator having a fluidized bed in a fluid catalytic cracking unit comprising,

a. regenerator means having a pressurized air supply means,
b. horizontal perforated circular tube means centered in said regenerator means,
c. splitter tube joint means for supplying air from said pressurized air supply means to said perforated circular tube means, and
d. said splitter tube joint means having a closed ended perforated cylinderical plenum means positioned vertically over and around a portion of said splitter tube joint means, said plenum means having air duct means for receiving air from said pressurized air supply means for providing an improved fluidized bed in the regenerator.

3,912,461

LOW TEMPERATURE METAL CARBONITRIDE COATINGS

Gene Felix Wakefield, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 85,846, Nov. 2, 1970, abandoned. This application May 24, 1973, Ser. No. 363,448
Int. Cl. B32b 15/04
U.S. Cl. 29—195 3 Claims

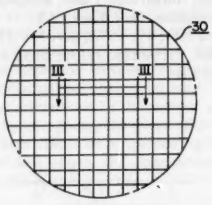
1. A computer storage disk or drum comprised of:

a. an aluminum substrate having at least one major surface,
b. an adherent nickel layer on said aluminum substrate,
c. an adherent magnetic film layer on said nickel layer, and
d. an adherent solid solution metal carbonitride coating on said magnetic film layer.

3,912,462
SELECTIVE DIMENSIONAL CONTROL OF FINE WIRE MESH

David L. Balthis, Ellicott City, and Frank A. Lindberg, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1974, Ser. No. 436,589
Int. Cl.² B21C *37/04;* B23P *3/10*
U.S. Cl. 29—191.6 11 Claims



1. Method of producing fine wire having an elongated generally rectangular cross-section, which wire has a cross-section which in a first direction is of a predetermined dimension, and in a second direction normal to the first direction has a significantly greater dimension, which method comprises:

a. disposing a wire within an evacuated chamber which is maintained at less than about 8×10^{-6} Torr pressure, with the wire disposed above an evaporable source of material disposed within said chamber;

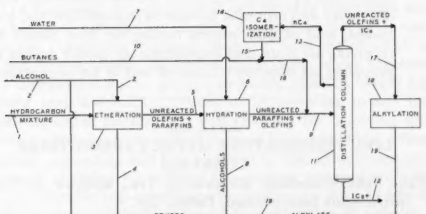
b. heating said wire to promote adherence of the later deposited material;

c. directing an electron beam onto said source of material to evaporate said material and deposit said material upon the heated wire surface exposed to the source of material so that the dimension in the direction normal to the surface exposed to said material source is increased.

3,912,463
HYDROCARBON CONVERSION PROCESS

Robert H. Kozlowski, Berkeley; Robert P. Sieg, Piedmont, and John W. Scott, Ross, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 50,123, June 26, 1970, Pat. No. 3,849,082. This application Oct. 25, 1974, Ser. No. 518,140
Int. Cl.² C10L *1/18*
U.S. Cl. 44—56 8 Claims



1. A process for producing a gasoline blending stock which comprises:

a. feeding an alcohol and a light hydrocarbon mixture containing at least tertiary olefins, linear olefins and isobutane to an etheration zone,

b. reacting the alcohol with the tertiary olefins in the etheration zone to obtain an ether and unreacted linear olefins and isobutane,

c. separating the ether from the linear olefins and isobutane,

d. feeding water and at least a portion of the linear olefins to a hydration zone,

e. reacting the water with the linear olefins in the hydration zone to obtain a product alcohol,

f. separating unreacted oleïns and paraffins from the secondary alcohol,

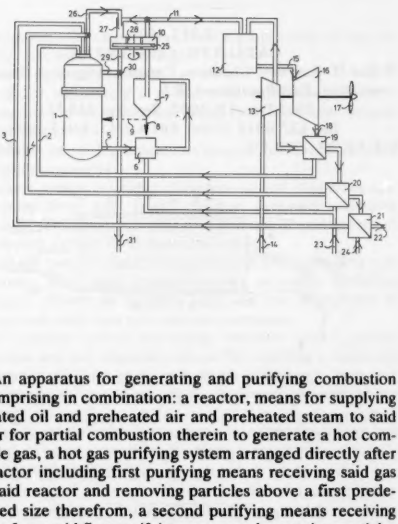
g. feeding at least a portion of the unreacted olefins and paraffins to an alkylation plant for reaction to obtain an alkylate, and

h. blending at least portions of the ether, product alcohol and alkylate to produce a gasoline blending stock.

3,912,464
METHOD OF AND DEVICE FOR SEPARATING SOLID COMPONENTS FROM A HOT COMBUSTIBLE GAS GENERATED IN A REACTOR

Harry Schulz, Wermelskirchen-Tente, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg A.G., Nurnberg, Germany

Continuation of Ser. No. 234,621, March 14, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,250
Claims priority, application Germany, Mar. 20, 1971, 2113599
Int. Cl.² B01D *46/00;* B01J *7/00;* C01B *2/14;* C10K *1/02*
U.S. Cl. 48—95 7 Claims



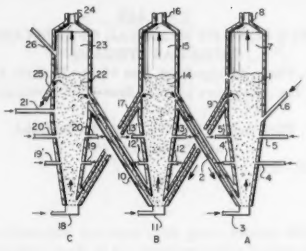
5. An apparatus for generating and purifying combustion gas comprising in combination: a reactor, means for supplying preheated oil and preheated air and preheated steam to said reactor for partial combustion therein to generate a hot combustible gas, a hot gas purifying system arranged directly after the reactor including first purifying means receiving said gas from said reactor and removing particles above a first predetermined size therefrom, a second purifying means receiving said gas from said first purifying means and removing particles above a second predetermined size smaller than said first predetermined size therefrom, said second purifying means comprising a housing, a filter disc rotatable in the housing, means for causing said hot gas to flow through a circumferential portion of said disc in one axial direction, and means for causing cleaned gas from said purifying system and steam to flow through another circumferential portion of said disc in the opposite axial direction, said filter disc having solid components collecting thereon conveyed back into said reactor and comprising a porous member formed of material selected from the class of sintered metal and ceramics, and said housing comprising divider means isolating the flow of said hot gas from the flow of said cleaned gas.

Coal conversion

3,912,465
CONTINUOUS CARBONIZATION AND GASIFICATION OF PARTICULATE COAL WITH DOUBLE RECIRCULATION OF FLUIDIZED PARTICULATE HEAT CARRIER

Daizo Kunii, 1-25-16 Nakamachi, Meguro, Tokyo, and Taiseki Kunugi, 7-17-22-903 Roppongi, Minato, Tokyo, both of Japan

Filed July 30, 1974, Ser. No. 493,647
Claims priority, application Japan, Aug. 18, 1973, 48-92080
Int. Cl.² C10J 3/54
U.S. Cl. 48—101 8 Claims

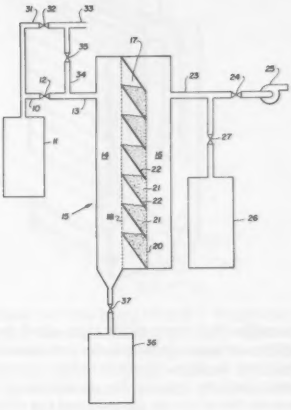


1. A continuous process for the carbonization and gasification of particulate coal with double recirculation of fluidized particulate heat carrier wherein the carbonization and gasification are separately carried out, which process comprises the steps of fluidizing particulate heat carrier having an average particle size of 0.1 to 5 mm with steam to form a first fluidized bed, passing said particulate heat carrier through said first bed in a densely fluidized state from the bottom upwardly to the top of said first bed, introducing particulate coal having an average particle size of 0.1 to 5 mm into said first bed thereby contacting said coal with said heat carrier to effect carbonization of the coal while maintaining said first bed at a temperature of 500° to 800°C, as measured at the top of said firstbed, withdrawing the resultant gas and oil vapor from said first bed, passing a mixture of the particulate heat carrier and particulate coke produced by the carbonization of the coal from the top of said first bed to the bottom of a second fluidized bed, said mixture being at a temperature of 500° to 800°C, combining at the bottom of said second fluidized bed said particulate mixture with particulate heat carrier coming from a third fluidized bed and being at a temperature of 850° to 1,100°C, said second fluidized bed being formed by fluidizing the combined particulate materials with steam, passing said combined particulate materials through said second fluidized bed in a desnely fluidized state from the bottom upwardly to the top of said second bed while maintaining said second bed at a temperature of 800° to 1,000°C, as measured at the top of said second bed thereby to effect gasification of the particulate coke, withdrawing the gasified product from said second bed, passing a portion of the particulate heat carrier, which is at a temperature of 800° to 1,000°C and is accompanied by remaining ungasified particulate coke, from the top of said second bed to the bottom of said third fluidized bed, which is formed by fluidizing said particulate heat carrier with steam or with a mixture of steam and air, passing said particulate heat carrier together with said accompanying ungasified particulate coke through said third fluidized bed in a densely fluidized state from the bottom upwardly to the top of said third bed, introducing a hot combustion gas containing air or oxygen into said third bed thereby burning said ungasified particulate coke and heating said particulate heat carrier to a temperature of 850° to 1,100°C, withdrawing ash formed by the combustion of the coke from said third bed, passing said heated particulate heat carrier from the top of said third bed to the bottom of said second bed for use in the gasification of coke, and passing another portion of the particulate heat carrier, which is at a temperature of 800° to 1,000°C, from the top of said second bed to the bottom of said first bed for use in the carbonization of coal.

3,912,466
GRANULAR MEDIA FILTERS

Frederick A. Zenz, P.O. Box 205, Garrison, N.Y. 10524

Filed Sept. 25, 1972, Ser. No. 291,588
Int. Cl.² B01D 46/30
U.S. Cl. 55—96 1 Claim



1. In a granular bed filter having entrance and exit sides in which a bed of granular material is supported in a filter compartment by screen means and in which a stream of dusty gas first passes through said granular material where suspended particles are removed from said gas stream and filtered gas exits through the screen means, the method of operating and cleaning said filter of particles removed from the dusty gas which method comprises the steps of introducing the dusty gas to the entrance of the filter in a continuous non-interrupted stream, periodically cleaning said granular material of accumulated particles filtered from the dusty gas by feeding a pulse of clean gas through said filter compartment in a reverse direction sufficient to fluidize the granular material in said filter compartment, reducing the flow of clean gas to a level below the incipient fluidization rate to allow the granular material to settle from its fluidized state into a bed at rest but sufficient to maintain a pressure on the exit side of said filter compartment higher than the pressure maintained on the entrance side of said filter compartment by the dusty gas stream whereby the flow of dusty gas into the filter compartment is prevented prior to settlement of the granular material into a bed supported on the screen means, and, after the granular material has settled into a bed at rest, arresting the flow of clean gas to allow the dusty gas to flow into the filter compartment and be filtered of entrained dust particles.

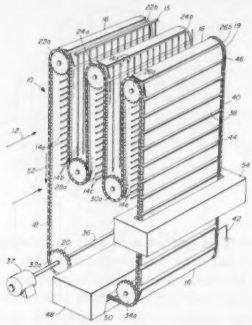
3,912,467
MOVING ELECTRODE ELECTROSTATIC PARTICLE PRECIPITATOR

John G. Trump, Winchester, and Helmut I. Milde, Andover, both of Mass., assignors to High Voltage Engineering Corporation, Burlington, Mass.

Filed Apr. 6, 1973, Ser. No. 348,743
Int. Cl.² B03C 3/10
U.S. Cl. 55—149 7 Claims

1. An electrostatic precipitator including a housing having fluid inlet and outlet means, electrode inlet and outlet means, a plurality of planar arrays of wire positioned in the stream of

fluid containing particles within said housing, a plurality of metallic plates of generally rectangular shape, the shorter dimension of which being disposed parallel to the direction of movement of the plates, the longer dimension of which being disposed perpendicular to the direction of movement of the plates, positioned adjacent to one another and adapted to be positioned between the arrays of wire, the plates forming a collecting electrode having multiple raised and depressed portions on the surface of the plates forming alternately open topped, open bottom enclosed areas for creating regions of



dimension smaller than those of the plate which have reduced electric fields to enhance particle collection therein and which are shielded from the fluid stream to reduce re-entrainment of the collected particles, means for producing a corona discharge between the arrays of the wire and the collecting electrode, and means connected successively to the shorter dimension of each of the plates of the collecting electrode for moving the plates around an endless path formed by said electrode between successive arrays of wire and extending outside said housing through said electrode inlet and said electrode outlet means provided therein.

3,912,468

AIR BUBBLE SEPARATING DEVICE

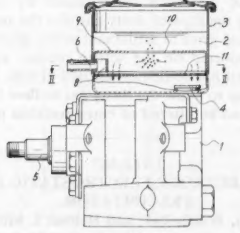
Takao Tsuchiya; Kazuyoshi Fukatsu, both of Kariya, and Toshio Hirokawa, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Oct. 8, 1974, Ser. No. 513,156

Claims priority, application Japan, Oct. 10, 1973, 48-113379

Int. Cl.² B01D *19/00*

U.S. Cl. 55—159 **3 Claims**



1. An air bubble separating device comprising:

a reservoir for accommodating a liquid;

an inlet provided in the reservoir for receiving the liquid;

an outlet provided in the reservoir for supplying the liquid;

a control plate provided in a position relative to said inlet such that fluid from said inlet strikes said control plate, the end of said control plate being extended along the side wall of said reservoir for generating a vortex flow of the liquid delivered toward said control plate from said inlet;

a stability plate mounted above said inlet for stabilizing the vortex flow and having a hole at the central portion thereof for passing therethrough air bubbles mixed in the liquid; and

a restricting member mounted below said inlet for permitting the passage of the liquid but restricting the passage of air bubbles therethrough to said outlet.

3,912,469

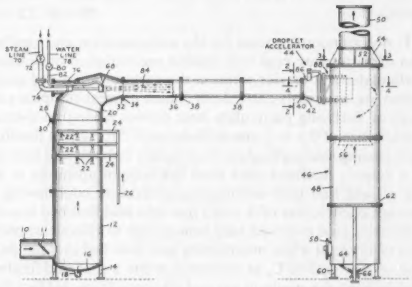
APPARATUS FOR THE REMOVAL OF CONTAMINANTS FROM GAS STREAMS

Thomas K. Ewan, Daingerfield, and Malley R. Bass, Longview, both of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Filed Sept. 11, 1974, Ser. No. 505,064

Int. Cl.² B01D *47/10*

U.S. Cl. 55—238 **2 Claims**



1. Apparatus for the removal of contaminant materials such as particulate matter and gaseous substances from a stream of gas comprising: a mixing tube, means comprising a steam and water ejector nozzle for forming a moving jet comprising a mixture of steam and aqueous droplets in said mixing tube to drive a gas containing at least one contaminant material through said mixing tube and to form therein a moving stream comprising a turbulent mixture of said gas and said contaminant material with said steam and said aqueous droplets, in which mixture said aqueous droplets by contact with said contaminant material remove said contaminant material from said gas, a pair of centrifugal separators each having a cylindrical wall for collecting and removing said aqueous droplets from said moving stream, means comprising a plurality of generally planar walls defining two separate passageways respectively connecting the interior of said mixing tube with the interiors of said pair of centrifugal separators for conducting said moving stream from said mixing tube and splitting said stream into two separate streams conducted respectively to said centrifugal separators, and for imparting to each of said moving streams as it enters the associated separator a rectangular cross section having its narrow dimension normal to said cylindrical wall of said associated separator, and said planar walls also including two adjustable guide vanes, each of said guide vanes extending from said mixing tube into one of said separators and being movable for varying the narrow dimension of one of said moving streams to individually control the velocities at which said moving streams respectively enter the associated centrifugal separators.

3,912,470
SEPARATOR FOR SEPARATING GASES OF DIFFERENT MOLECULAR WEIGHT AND CHROMATOGRAPHY ARRANGEMENT

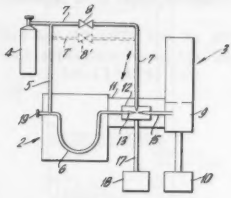
Rudolf Fluckiger, Balzers, Switzerland, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed June 24, 1974, Ser. No. 482,273

Claims priority, application Switzerland, June 27, 1973, 009470/73

Int. Cl.[2] B01D *15/08*

U.S. Cl. 55—386 **6 Claims**



1. In a separator for separating gases having different molecular weights, such as for separating the lighter carrier gas from the heavier gas to be analyzed in gas chromatography, of the type having an evacuable chamber serving as a jet separator and provided with an inlet nozzle for directing a molecular jet of the mixed gas into the chamber for undisturbed expansion therein, an outlet nozzle coaxially aligned with the inlet nozzle and facing and adjacently spaced therefrom to split the molecular jet of gases into a heavier useful core portion, flowing through the outlet nozzle, and a lighter residual peripheral portion, the axial spacing of the inlet and outlet nozzles being such that the molecular jet of mixed gases leaving the inlet nozzle traverses the space between the inlet and outlet nozzles while maintaining its molecular flow without turbulence, means controlling the volume of the stream of heavier useful gas removed through the outlet nozzle, and a connection to a pump for evacuating the lighter residual gas from the chamber, the improvement comprising, in combination, a conduit including a further inlet nozzle opening and — adjacent said inlet and outlet nozzles in said chamber; and means connected to said further inlet nozzle for directing a regulable stream of auxiliary gas under pressure through said further inlet nozzle opening in a direction to intersect and controllably deflect said molecular jet in the space between said inlet and outlet nozzles to control the amount of heavier useful gas entering said outlet nozzle and flowing therethrough.

3,912,471
HIGH VELOCITY MOISTURE ELIMINATOR

Worth Cotton, Jr., Greensboro, N.C., assignor to Industrial Air, Inc., Greensboro, N.C.

Filed July 1, 1974, Ser. No. 484,550

Int. Cl.[2] B01D *45/00*

U.S. Cl. 55—440 **6 Claims**

1. An apparatus for eliminating moisture droplets from a high velocity gaseous stream comprising:

a. a plurality of vertically extending eliminator blades arranged in parallel relationship with each other in the path of said gaseous stream;

b. each of said blades including a plurality of successive planar sections having a separation surface on one side thereof and a trailing edge on the downstream edge of said separation surface, each of said planar sections being arranged at an obtuse angle with respect to the adjacent planar sections;

c. said obtuse angles being so directed that at least two successive planar sections have the separation surface thereof on the same side of said blade;

d. a hook extending along the trailing edge of each said planar sections to guide accumulated moisture droplets to a collection area below said apparatus and;

e. said planar sections being of such a length that said gaseous stream impinges thereon at a point substantially upstream of said hook extending along the trailing edge of each of said planar sections, whereby separation occurs at the upstream portion of said planar sections, rather than at or adjacent said hooks.

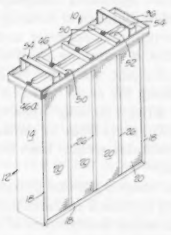
3,912,472
AIR FILTER FOR GASEOUS POLLUTANTS

Robert I. Marble, Gardena, Calif., assignor to Farr Company, El Segundo, Calif.

Filed Dec. 29, 1971, Ser. No. 213,474

Int. Cl. B01d *53/04*

U.S. Cl. 55—484 **3 Claims**



1. For a filter of the type utilizing activated carbon as a filtering media for removing gaseous pollutants from an air flow, a filter housing comprising an open faced housing having rear and side walls and a pair of air-pervious walls, said air-pervious walls defining inlets to said housing, a pair of inner air-pervious walls disposed within said housing and extending between said side walls of said housing, said inner air-pervious walls dividing the interior of said housing into a plurality of channels, one of said channels being adjacent each of the air-pervious walls of said housing, thereby defining a pair of outer channels, and another of said channels being disposed between said outer channels, and a U-shaped sealing member carried by said housing, said sealing member having a base and arm portions, said arm portions being substantially perpendicular to said base portion, said base portion being secured to said side walls and said rear wall of said housing, one arm of said sealing member extending into one of said outer

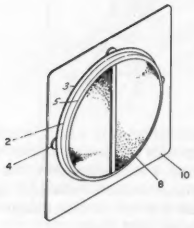
channels and the other of said arms extending into the other of said outer channels, whereby any air flow along a side or rear wall of said housing is directed into the interior of one of said outer channels and means for sealing the outer channels.

3,912,473

QUICK-CLEAN VENT FILTER

Wayne Eldo Wilkins, 3063 Hiway 50, Grand Junction, Colo. 81501

Filed May 21, 1973, Ser. No. 362,093
Int. Cl.² B01D *46/10*
U.S. Cl. 55—501 **3 Claims**



1. A filter apparatus intended for use with vent and exhaust type fan assemblies mounted in a wall or ceiling of a room with a perforated type fan grill disposed over the intake end of the fan assembly, the filter apparatus comprising:

a hollow open ended cylindrical housing having cylindrical side walls terminating at opposite ends in an inner end and an outer end, a retaining strap extending diametrically between the side walls at the outer end thereof, means for retaining the strap between said side walls, an annular flange affixed to said inner end and projecting radially outwardly therefrom to define a circular outer edge having a diameter greater than the interior diameter of the side walls;

a flat circular disc shaped fibrous porour filter pad having flat parallel front and back surfaces interconnected about their peripheral edges by cylindrical side wall surfaces, the diameter of said pad being substantially equal to the interior diameter of said housing side walls, the thickness of said pad adapted to be received between said retaining strap at said front face and a surface of said fan grill at said back face; and

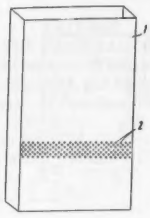
a plurality of permanent magnet members affixed to circumferally spaced apart positions on said annular flange and projecting outwardly therefrom in a direction opposed to said housing side walls, said magents adapted to magnetically retain said housing to a surface of said fan grill with said filter pad overlying said fan grill perforations between said retaining strap and said fan grill to filter all air passing therethrough and into said fan assembly to prevent the build-up of dirt, grease, and the like in said fan assembly, the housing and filter pad being readily removed from said fan grill for cleansing and replacement of said filter pad and permitting ready access to said fan assembly for servicing thereof.

3,912,474

DEPOSITING CHUTE FOR PNEUMATIC CONVEYANCE OF FLOCK

Werner Hermann Hans Drews, Rheydt, Germany, assignor to Trutzschler and Company, Rheydt-Odenkirchen, Germany

Continuation of Ser. No. 84,293, Oct. 27, 1970, abandoned. This application Nov. 9, 1972, Ser. No. 305,210
Claims priority, application Germany, Oct. 3, 1969, 1950022
Int. Cl. B01d *39/12*
U.S. Cl. 55—524 **4 Claims**



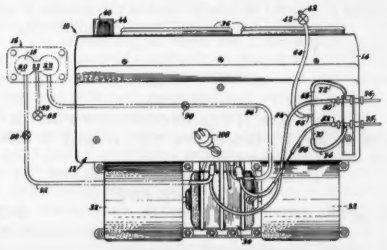
1. In a pneumatic conveyor a rectangular depositing chute having a rectangular cross section over its entire height characterized by metal walls which are parallel to one another which one of the walls contain apertures across said one wall in one area thereof adapted to permit the passage of pneumatic gas therethrough; the improvement which comprises a layer of plastic material on the inside of said metal walls and within the thickness thereof at said apertures, which plastic is a fluorinated polyolefin polymer which has a smooth surface and has a coefficient of friction which is lower than that of the metal walls preventing the apertures from being clogged.

3,912,475

COMBINED AIR CONDITIONER, BEVERAGE COOLER, AND ENGINE EFFICIENCY BOOSTER

Earnest H. Patrick, 1301 S.W. 56th Ave., Fort Lauderdale, Fla. 33315

Filed Aug. 7, 1974, Ser. No. 495,388
Int. Cl.² F25B *19/00*
U.S. Cl. 62—7 **16 Claims**



1. A vehicle auxiliary, comprising:

coolant coil means;

housing means in which the coolant coil means is enclosed; the housing means having access means permitting access to the zone within the housing means which, with respect to coolant operability of the said coolant coil means, is operatively adjacent the coolant coil means, for use thereof as a cooler of beverage or other matter inserted through said access means to the said zone;

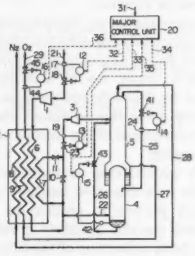
blower means for blowing air operatively past the coolant coil means;

the housing means also having a movable panel means, in which in a first position it provides a shielding insulation for a portion of a zone adjacent the coolant coil means, and in which in a second position it provides an opening by which the air blown by the blower means emerges into the vehicle to provide an air conditioning effect for the vehicle.

3,912,476
AIR SEPARATING APPARATUS

Hiroji Mikawa; Yomei Kato, both of Hitachi, and Kiyoshi Sasaki, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 19, 1974, Ser. No. 462,542
Claims priority, application Japan, Apr. 20, 1973, 48-24539
Int. Cl.² F25J *3/00*
U.S. Cl. 62—37 **3 Claims**



1. An air separating apparatus comprising:

a rectifying tower having an upper section and a lower section, inlet means for introducing crude air into the lower section of said rectifying tower, outlet means for discharging product gases from the upper section of the rectifying tower; first conduit means extending from the lower section of the rectifying tower for directing liquid N_2 into the upper section of the rectifying tower, and second conduit means for directing liquid air from the lower section of the rectifying tower to the upper section of the rectifying tower;

a first minor control system for controlling a flow rate of a quantity of crude air introduced into the apparatus;

a first means for cooling the crude air thus introduced;

a second means for introducing at least a portion of the crude air thus cooled into the lower section of the rectifying tower;

a third means for introducing another portion of the crude air cooled by said first means into the upper section of the rectifying tower, said third means including at least an expansion turbine;

a second minor control system for controlling pressure of the crude air at the entrance of said expansion turbine;

a third minor control system for controlling a rate of flow of nitrogen within said first conduit means from said lower section of said rectifying tower to the upper section of said rectifying tower;

a fourth minor control system for controlling a liquid level of liquid air in said lower section of the rectifying tower, said fourth minor control system including means for controlling passage of liquid air within said second conduit means from said lower section of the rectifying tower to the upper section of said rectifying tower;

a fifth minor control system controlling a flow rate of product gases discharged from the upper section of the rectifying tower;

said minor control systems each generating an information signal representing a measurement of the process variable controlled by each of said minor control systems; and

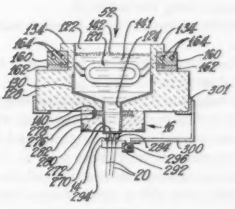
a major control system to which information signals from at least the first, second, third and fifth minor control systems are transmitted as inputs together with signals of a desired quantity of product gases needed for a given demand as inputs, said major control system producing, in response to the information signals and the signals of a required quantity of product gases, target value signals for said first, second, third and fifth minor control systems which are required for maintaining a ratio between the flow rate of a downwardly moving liquid and an upwardly moving vapor within said rectifying tower constant; and

said respective minor control systems each regulating the process variable controlled to correspond to said target value signals.

3,912,477
APPARATUS FOR PROCESSING GLASS BATCH MATERIAL

William C. Brady, Granville, and William F. Giles, Maumee, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 321,412, Jan. 5, 1973, abandoned, which is a continuation of Ser. No. 70,811, Sept. 9, 1970, abandoned. This application Oct. 15, 1974, Ser. No. 514,545
Int. Cl.² C03B *5/08;* **C03b** *37/02*
U.S. Cl. 65—1 **5 Claims**



1. Apparatus for producing continuous glass filaments comprising:

a melting receptacle of high temperature resistant material having at least a partially open top and a partially open bottom, glass formed in the receptacle flowing downwardly through the partially open bottom;

a plurality of adjacent generally parallel longitudinal heating elements each extending along a longitudinal axis across the interior of the receptacle, the elements including a hollow outer electrical current conducting portion and heat resistant material within the outer portion, the heating elements being positioned to be beneath the surface of a body of molten glass formed within the receptacle, the longitudinal heating elements having an elongated central portion including two spaced apart parallel straight cylindrical portions and shorter end portions connecting the straight portions, the heating elements each including a connector at each end extending along the longitudinal axis of its heating element, the straight portions being in a plane oriented generally vertically;

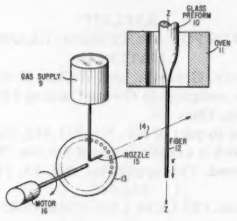
means for delivering batch mineral material in comminuted form to the receptacle through the opening in the top of the receptacle;

means electrically connecting the heating elements in parallel for supplying electrical energy effective to heat the current conducting portion of the heating elements to form molten glass from the batch mineral material;

a feeder communicating with the melting receptacle through the bottom opening in the melting receptacle, molten glass flowing from the melting receptacle through the bottom opening into the feeder, the bottom of the

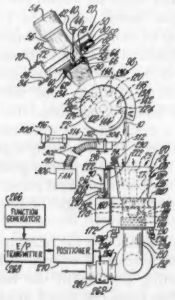
feeder having holes through which the molten glass flows as molten streams;
electrical means effective to heat the feeder; and
means for attenuating the molten glass streams into continuous glass filaments.

3,912,478
METHODS OF INTRODUCING GEOMETRICAL VARIATIONS IN OPTICAL FIBERS
Herman Melvin Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 17, 1974, Ser. No. 479,820
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **5 Claims**



1. A method of introducing geometrical variations along an optical fiber comprising the steps of;
heating a source of optical fiber-forming material to a softened state;
drawing a fiber from said heated source;
Characterized in that:
as said fiber emerges from said heated source at least one gas stream is directed against said fiber with an intensity which varies as a function of time and is sufficient to permanently deform said fiber;
and in that the spatial distribution of the deformations formed along said fiber varies in accordance with the intensity fluctuations of said gas stream.

3,912,479
METHOD OF AND APPARATUS FOR PACKAGING A LINEAR GLASS FIBER ELEMENT
Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Oct. 1, 1974, Ser. No. 510,935
Int. Cl.² C03B *37/04, 37/06*
U.S. Cl. 65—2 **8 Claims**



1. The method of producing and packaging a coherent linear sliver-like glass textile element capable of being formed into a yarn comprising:
supplying discontinuous glass fibers;
transporting the fibers in a body of moving gas to an advancing porous surface;
depositing the fibers onto the advancing porous surface in sufficient interengaging relationship to form a coherent web;
drawing the moving gas through the openings in the advancing porous surface in the region of fiber deposition to separate the gas from the fibers;
advancing the surface along a path effective to move the web of fibers across a stationary opening having a progressively reducing dimension in the direction of surface advancement;
drawing air into the stationary opening through the fibers of the web and the porous surface with sufficient energy to gather the fibers of the web in a direction laterally of the advancement of the surface, the web being gathered progressively as it is moved across the stationary opening into a relatively loosely associated but coherent linear sliver-like textile element;
linearly advancing the linear fibrous textile element downwardly to collect in a rotating foraminous container;
withdrawing air from the container through its foraminous bottom wall to move the air downwardly through the body formed by the collected portion of the fibrous element building-up in the container and thereby prevent freedom of movement of the fibrous element of the body during packaging;
simultaneously withdrawing air uniformly from all sides of the container in a direction laterally through its foraminous sidewall portion to reduce air turbulence in the container and thereby promote conditions in the container for orderly collection of the fibrous element during its packaging.

3,912,480
GLASS ANNEALING PROCESS
Igor Alexandrovich Boguslavsky, ulitsa Nametkina, 19, korpus 2, kv. 27; Serafin Maximovich Brekhovskikh, Orlikov pereulok, 6/1, kv. 69; Vladimir Alexeevich Abrosimov, ulitsa Gastello, 39, kv. 59, and Julia Nikolaevna Viktorova, Lyalin pereulok, 24/26, kv. 32, all of Moscow, U.S.S.R.
Continuation of Ser. No. 215,887, Jan. 6, 1972, abandoned.
This application Jan. 2, 1974, Ser. No. 429,823
Int. Cl.² C03C *17/22;* **C03B** *35/00, 25/00*
U.S. Cl. 65—30 **1 Claim**

1. A glass annealing process consisting of the following steps: heating the glass to its annealing temperature, holding the glass at this temperature in a molten salt bath with a viscosity of not more than 100 cp and subjecting the glass simultaneously during the holding step to the influence of mechanical vibrations at an audio frequency ranging within 20–18000 cps, generated within the molten salt bath, followed by cooling the glass.

3,912,481
METHOD FOR MAKING ALKALI METAL SILICATE THERMOPLASTIC MATERIALS
Roger F. Bartholomew, Painted Post; Harold F. Dates, Corning; Stanley D. Stookey, and Walter H. Tarcza, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Feb. 25, 1974, Ser. No. 445,453
Int. Cl.² C03C *23/00*
U.S. Cl. 65—30 **24 Claims**

1. A method for making a glass body exhibiting thermoplastic properties which comprises the steps of:
a. hydrating a glass body consisting essentially, in mole percent on the oxide basis, of about 3–25% Na_2O and/or K_2O and 50–95% SiO_2, the sum of those constituents constituting at least 55% of the total composition, by exposing said body to a H_2O-containing gaseous environment having a relative humidity of at least about 75% at

a temperature of at least about 100°C. for a period of time sufficient to develop at least a surface portion which is essentially saturated with water; and, thereafter,

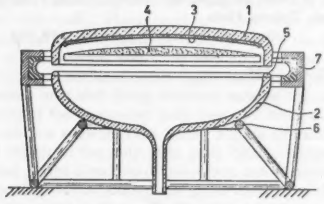
b. dehydrating said body through contact thereof with a gaseous environment wherein the relative humidity is less than about 90% of that employed in said hydration step for a period of time sufficient to reduce the water content at least within said surface portion but leaving an effective amount therein to impart the desired thermoplastic properties thereto.

3,912,482

METHOD OF PROVIDING A SEALED JOINT FOR JOINING PARTS OF A VACUUM VESSEL

Coenraad Maria La Grouw; Cornelus Wilhelmus Theresia van den Wittenboer, and Hendrik Jan Hubers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 180,902, Sept. 15, 1972, abandoned.
This application Mar. 9, 1973, Ser. No. 339,602
Claims priority, application Netherlands, May 18, 1968, 6807090
Int. Cl.² C03C *27/10*
U.S. Cl. 65—43 **9 Claims**



1. A method of sealing parts of an evacuated glass vessel comprising the steps of:

forming a mixture of a comminuted non-crystallizing solder glass having a coefficient of thermal expansion which is higher than that of the material of the surfaces of the parts to be joined and an admixed comminuted glass having a coefficient of thermal expansion less than 40×10^{-7} to form a non-crystallizing solder glass the soldering temperature of which lies below the deformation temperature of the parts to be joined and below the temperature to which the vessel is heated during evacuation;

applying the glass mixture to the surfaces of the parts to be joined;

heating the glass mixture to a temperature, and for a sufficient time, to solder the surfaces of the parts without completely dissolving the admixed glass particles;

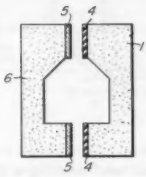
cooling the soldered parts to increase the stress-build-up temperature of the seal above the temperature at which the vessel is heated during evacuation whereby the solder glass of said seal will not become soft during subsequent evacuation of said vessel at an elevated temperature which is above that of the sealing temperature.

3,912,483

METHOD OF MAKING A MAGNETIC HEAD

Hiroshi Sugaya, Suita; Takeshi Ishihara, Neyagawa, and Kisuke Sawai, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 225,511, Feb. 11, 1972, abandoned.
This application Jan. 15, 1974, Ser. No. 433,480
Claims priority, application Japan, Sept. 25, 1968, 43-70656; Oct. 22, 1968, 43-77727
Int. Cl.² C03C *27/00*
U.S. Cl. 65—43 **15 Claims**



1. A method of making a magnetic head comprising two core members each having a gap-defining face separated by a gap spacer of a glass of predetermined composition composed of at least two component materials, one of said component materials having a melting point higher than the melting point of said glass and at least as high as the temperature at which the magnetic properties of said core member deteriorate and the other component having a lower melting point, said method comprising the steps of:

interposing at least one layer of each of said at least two component materials between the gap-defining faces of said spaced apart core members to thicknesses corresponding to the volume percentage compositions of said component materials in said glass;

joining said core members with said gap-defining faces abutting each other, said at least two layers being placed one upon another between said joined core members; and heating the joined core members at a temperature lower than said melting point of said one of said component materials and higher than the melting point of said glass for a time sufficient to permit said two component materials to form a single layer of said glass in the space between the gap-defining faces of said core members.

3,912,484

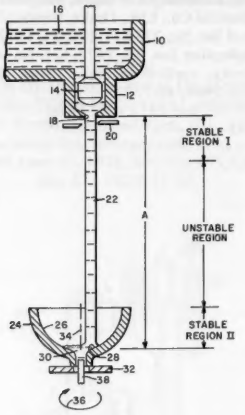
METHOD OF GLASS DELIVERY FOR PRESS-FORMING

George C. Shay, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,261
Int. Cl.² C03B *7/00*
U.S. Cl. 65—70 **5 Claims**

1. A method of delivering a substantially blister and seed free uniform charge of molten glass from a discharge orifice to a forming mold which comprises, positioning a mold having a mold cavity below a discharge orifice such that a bottom portion of said mold cavity is at least about five feet below said discharge orifice, rotating said mold about a vertical axis, supplying a uniform stream of molten glass from said dis-

charge orifice to said rotating mold, impinging said stream on said bottom portion at a position adjacent to but slightly offset



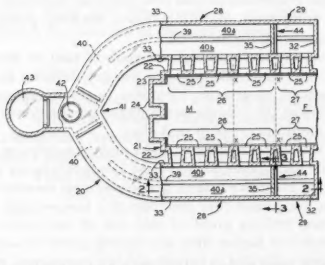
from said vertical axis, and forming a pool of substantially seed and blister free glass in the bottom of said mold cavity.

3,912,485

GLASS MELTING FURNACE AND METHOD OF OPERATION

Charles F. Green, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 19, 1973, Ser. No. 407,895
Int. Cl. C03b *5/16*
U.S. Cl. 65—136 **9 Claims**



1. A method of firing a regenerative glass melting furnace for increasing and decreasing the size of its melting area, said furnace comprising a tank containing a bath of molten glass flowing successively from its charging end through melting and refining zones toward its exit end and including a first regenerator communicating with a first plurality of ports and a second regenerator downstream of said first regenerator and communicating with at least one additional port along a common side of said melting zone wherein the first plurality of ports may be fired alone or in combination with the at least one port to create a hot spot in the molten glass bath movable along the melting zone comprising the steps of:

a. alternately supplying combustion air to, and exhausting hot waste gases from, said first and second regenerators via a common path; and

b. controlling the flow of combustion air and hot waste gases in said common path between said first and said second regenerators to control the firing of said additional port communicating with said second regenerator.

3. In a reversing regenerative glass melting furnace including a tank containing a bath of molten glass flowing from its charging end successively through melting and refining zones toward its exit end, wherein the melting zone including a plurality of opposed ports on each of two sides of the tank and the ports on each side are alternately connectible to a source of combustion air and an exhaust flue, the improvement comprising:

a. a first regenerator disposed on each side of said tank connected to a first group of said ports adjacent to each other and closest to the exit end of said tank;

b. a second regenerator disposed on each side of said tank downstream from said first regenerator and connected to at least one additional port of said plurality of ports adjacent to the first group of said ports;

c. a tunnel disposed on each side of said tank commonly connected to said first and said second regenerator for placing said regenerators in communication with the source of combustion air and the exhaust flue; and

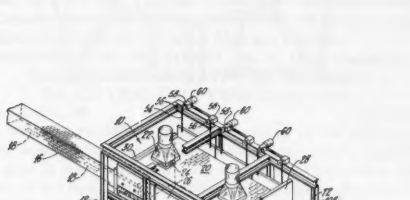
d. means disposed in each said tunnel between said first and said second regenerators which alternately and selectively controls the flow of combustion air through each said tunnel to its said second regenerator and the exhaust of hot waste gases from said second regenerator through each said tunnel without interfering with the flow of gases to and from said first regenerators, whereby the size of the melting area of said tank may be selectively increased and decreased.

3,912,486

GLASS MELTING APPARATUS AND METHOD OF OPERATING SAME

Ewald H. Jauch, Granville, and Edward C. Heubach, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 24, 1973, Ser. No. 409,194
Int. Cl.² C03B *5/16*
U.S. Cl. 65—136 **11 Claims**



9. A glass melting furnace comprising a melting tank, a plurality of upright walls around said tank to enclose same and aid in separating the tank from ambient conditions, means for supplying glass batch to said tank, means for supplying heat above said tank, means for supplying heat below the surface of the batch therein, and means for raising said upright walls to expose the surface of the batch within said tank to ambient conditions to cool the surface thereof.

3,912,487

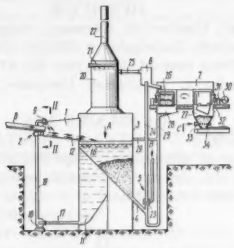
APPARATUS FOR PRODUCING GRANULATED SLAG

Mikhail Alexeevich Sharanov, Tekhnologicheskaya ulitsa, 3, kv. 19; Gennady Alexeevich Silukov, ulitsa Malysheva, 21, kv. 100; Valentin Petrovich Khainovsky, Tekhnologicheskaya ulitsa, 3, kv. 26, all of Sverdlovsk; Felix Yanovich Olginsky, ulitsa Bazhova, 1, kv. 87, Moscow; Vladimir Alexeevich Solovykh, prospekt Mira, 188, kv. 54, Moscow, and Alexandr Efimovich Sukhorukov, Prostornaya ulitsa, 34, korpus 1, kv. 74, Moscow, all of U.S.S.R.

Filed June 24, 1974, Ser. No. 482,163

Int. Cl.² C03B *5/18, 19/08*

U.S. Cl. 65—141 **3 Claims**



1. An apparatus for the production of granualated slag, comprising: a closed chute to receive fluid slag supplied from melting furnaces; a granulator arranged at the intake portion of said chute to granulate fluid slag to produce pulp; a bunker hermetically connected to the outlet portion of said chute to receive the downward pulp flow from said chute, said bunker being filled with water whose level is no less than 100 mm from the bottom of said chute in order to damp the kinetic energy of said downward pulp flow and minimize the disturbance of the water surface; a slab rigidly secured to the walls of said bunker, said slab being disposed outside the zone of direct impact of the downward pulp flow and being partially immersed with its edge into the water; a grate to catch light suspended matter in the pulp, said grate being arranged behind said slab, in the direction off said zone and adjoining said slab; an overflow wall adjoining said grate for the overflow of clarified water produced as a result of the damping of the kinetic energy of the pulp flow and removing light suspended matter therefrom; a container for the accumulation of clarified water, said container adjoining said bunker; an airlite connected to the lower portion of said bunker and intended to receive thickened pulp produced as granulated slag settles in the lower portion of said bunker; a dehydration and drying means for the dehydration and drying of thickened pulp supplied by the airlift, whereby dehydrated granulated slag is produced; and a means for the accumulation of said granulated slag.

3,912,488

ELECTRIC FURNACE OUTLET

Steve Douglas Sanford, Richmond, Ind.; Vaughn Charles Chenoweth, Hollanburg, Ohio, and Duane Harold Faulkner, Cambridge, Ind., assignors to Johns-Manville Corporation, Denver, Colo.

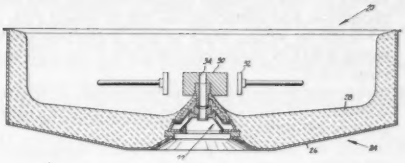
Filed July 25, 1974, Ser. No. 491,885

Int. Cl.² C03B *5/26*

U.S. Cl. 65—326 **15 Claims**

1. In an electric furnace for melting glass and other high melting point materials at temperatures exceeding 2500°F, said furnace including a vessel, means for electrically heating and melting the materials within the vessel, and an outlet means extending through a wall of said vessel from the interior of said furnace to the exterior of said furnace for withdrawing molten material from said vessel, the improvement comprising:

said outlet means including a first outlet orifice having one end in the interior of said vessel and through which molten material passes upon withdrawal from said vessel, said first outlet orifice comprising a corrosion resistant metal having a melting point in excess of 3000°F, but which must be protected from an oxidizing atmosphere at the temperature of the molten material, and means for shielding said first outlet orifice from an oxidizing atmosphere



without the need for the use of a neutral or reducing gas surrounding the outlet, said shielding means consisting essentially of a second outlet orifice below said first outlet orifice, said second outlet orifice being made from a refractory metal having a higher oxidation resistance than the metal in said first outlet orifice, and fluid cooling means at least surrounding said second outlet orifice for maintaining said second outlet orifice at a temperature below its critical or melting temperature.

3,912,489

HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 1, 1972, Ser. No. 258,711

Claims priority, application Germany, June 24, 1971, 2131401

Int. Cl.² A01N *9/22*

U.S. Cl. 71—91 **1 Claim**

1. A herbicide composition comprising a herbicidally effective amount of a mixture of

a. a member selected from the group consisting of 3-isopropyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxide, the sodium salt thereof and the dimethylamine salt thereof; and

b. a member selected from the group consisting of N-3-chloro-4-methoxyphenyl-N′-methyl-N′-methoxyurea, N-3-chloro-4-methylphenyl-N′,N′-dimethylurea, N-(2-benzothiazolyl)-N-methyl-N′-methylurea, N-4-chlorophenyl-N-methyl-N′-butyn-1-yl-3-urea, and N-3-chloro-4-methoxyphenyl-N′,N′-dimethylurea

in a weight ratio of (a) to (b) in the range of 3:1 to 1:3.

3,912,490

PLANT AND SOIL OXYGENATING COMPOSITION AND METHOD

Malcolm P. Boghosian, 4632 Cerritos Drive, Long Beach, Calif. 90807

Filed Jan. 14, 1974, Ser. No. 433,395

Int. Cl.² C05C *9/00*

U.S. Cl. 71—28 **12 Claims**

1. A method of improving plant appearance and preventing injury to plants from overwatering comprising treating support media adjacent to a plant's roots with an effective amount of urea peroxide or hydrogen peroxide.

RJW

3,912,491
HIGH-MAGNESIUM AMMONIUM POLYPHOSPHATE SOLUTIONS

William Percy Moore, Hopewell, Va., and James Earl Sansing, Baton Rouge, La., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,832
Int. Cl.² C05B *11/00*
U.S. Cl. 71—34 **2 Claims**

1. A process for producing and storing a stable high-magnesium ammonium polyphosphate solution comprising:

a. mixing 24–40% by weight aqueous ammonia with superphosphoric acid containing 66–76% by weight P_2O_5 and 0.7–2.0% by weight MgO to give a reaction solution having a P_2O_5/N weight ratio of 3.6–3.8 and a pH in the range 5.4–5.7;

b. maintaining the temperature of the reaction at 50°–70°C.;

c. cooling said reaction solution after mixing to a temperature of 25°–35°C.;

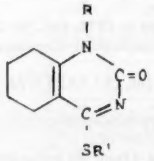
d. storing the solution at pH 5.4–5.7 at a temperature of 25°–35°C. in carbon steel tanks, whereby the solution remains stable and does not precipitate solids for at least 250 days, and shows a corrosion rate in said carbon steel tanks of 1.0–1.4 mils per year, said corrosion rate being measured below the air-liquid interface of the solution.

3,912,492
TETRAHYDROTHIOQUINAZOLINONES

John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 172,914, Aug. 18, 1971, Pat. No. 3,812,121. This application Jan. 25, 1974, Ser. No. 436,820
Int. Cl.² A01N *9/22*
U.S. Cl. 71—76 **11 Claims**

1. A phytotoxic composition comprising an adjuvant and a herbicidally effective amount of a compound of the formula



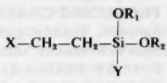
wherein R is selected from the group consisting of alkyl having from 1-6 carbon atoms, cyclohexyl, mono- and dihalophenyl and benzyl; and R′ is a hydrocarbon radical of from 1–12 carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl and benzyl.

3,912,493
BETA-HALOGENOETHYLSILANES AS FRUIT ABSCISSION AGENTS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 443,179
Int. Cl.² A01N *9/00*
U.S. Cl. 71—79 **6 Claims**

1. A method for regulating the growth of plants as to facilitate fruit abscission which comprises applying to said plants a fruit-abscising amount of a compound of the formula



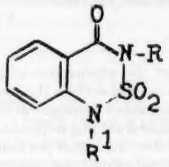
wherein X is chlorine or bromine; Y is a group $—OR_3$ and each of R_1, R_2 and R_3 is an alkyl radical having 1 to 5 carbon atoms.

3,912,494
HERBICIDE

Adolf Fischer, Mutterstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 24, 1974, Ser. No. 473,222
Claims priority, application Germany, June 3, 1973, 2329044
Int. Cl.² A01N *9/36*
U.S. Cl. 71—87 **2 Claims**

1. A herbicide composition comprising a herbicidally effective amount of a mixture of herbicides consisting essentially of a. a compound of the formula



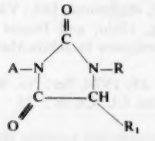
where R denotes lower alkyl of a maximum of 4 carbon atoms and R^1 denotes hydrogen, or a salt thereof, and b. S—(2-methyl-1-piperidylcarbonylmethyl)—0,0—di-n-propyldithiophosphate in a weight ratio of a to b of 5:1 to 1:5.

3,912,495
2,5-DIOXO-IMIDAZOLIDINES AS SELECTIVE HERBICIDES

Hans Moser, Magden, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 292,709, Sept. 27, 1972, Pat. No. 3,843,670. This application Aug. 8, 1974, Ser. No. 495,734
Claims priority, application Switzerland, Sept. 30, 1971, 14213/71
Int. Cl.² A01N *9/22*
U.S. Cl. 71—90 **16 Claims**

1. A herbicidal composition for combatting weeds in crop cultures which comprises a herbicidally effective amount of a compound of the formula



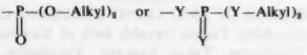
(I)

wherein

A represents a 1,2,4-thiadiazolyl- (5)- or 1,3,4-thiadiazolyl-(5)-radical which is substituted on the only substitutable C-atom, in the 3- or 2-position, by halogenalkyl, alkylthio, alkylsulphinyl, alkylsulphonyl or dialkylsulphamoyl, the alkyl groups of which contain from 1 to 3 carbon atoms,

R represents a C_1–C_3 alkyl radical,

R_1 represents halogen, or a radical —OR_2 wherein R_2 denotes hydrogen, or the group —CO—Z wherein Z stands for alkylamino, dialkylamino, alkyl, halogenoalkyl or alkylthio, the alkyl groups of which contain from 1 to 3 carbon atoms, and, finally, wherein R_1 also represents a group of the formula



wherein alkyl represents C_1–C_3 alkyl groups and the individual substituents Y independently ot each other represent oxygen or sulphur; together with a suitable carrier therefor.

3,912,496

UREIDOTRIAZOLES AS CYTOKININS AND PLANT ANTISENESCENCE AGENTS

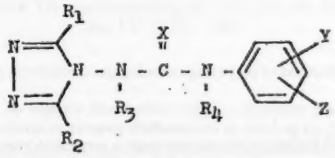
Maged M. Fawzi, and Bruno Quebedeaux, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 293,540, Sept. 29, 1972, Pat. No. 3,836,350, which is a continuation-in-part of Ser. No. 191,061, Oct. 20, 1971, abandoned. This application June 27, 1974, Ser. No. 483,568

Int. Cl.² A01N *9/22*

U.S. Cl. 71—92 **3 Claims**

1. A method for increasing fruit set comprising applying to the crop in antisenescence amount of a compound of the formula:



wherein

each of R_1 and R_2 independently is hydrogen or alkyl of 1 through 6 carbon atoms; provided that the sum of R_1 and R_2 does not exceed 8 carbon atoms;

each of R_3 and R_4 independently is hydrogen or alkyl of 1 through 4 carbon atoms;

X is oxygen or sulfur;

Y is hydrogen or fluorine; and

Z is hydrogen, halogen, a nitro group, a cyano group, trifluoromethyl, alkyl of 1 through 4 carbon atoms, SR_5, or OR_5, where R_5 is alkyl of 1 through 4 carbon atoms.

3,912,497

PLANT GROWTH REGULATOR

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 12, 1970, Ser. No. 36,702

Int. Cl.² A01N *9/20*

U.S. Cl. 71—104 **2 Claims**

1. A method of regulating the growth habit of plants comprising applying to the plants or a locus to be regulated an effective amount of cinnamyl thiocyanate.

3,912,498

PROCESS FOR CLASS IV-B METALS ORE REDUCTION

Paul Franklin Taylor, Crossville, Tenn., assignor to The TICOA Company, Incorporated, Crossville, Tenn.

Continuation-in-part of Ser. No. 117,098, Feb. 19, 1971, Pat. No. 3,811,871. This application May 20, 1974, Ser. No. 471,803

Int. Cl.² C22B *1/00, 34/10, 4/04, 3/00*

U.S. Cl. 75—1 **56 Claims**

1. A method of reducing titanium dioxide to titanium comprising the steps of:

A. Adding powdered titanium dioxide to a solution consisting essentially of about 24.2 parts by weight of phosphoric acid, about 0.5 part by weight of zinc oxide, and about 1 part by weight of a sulfated surfactant,

B. dissolving about ½-pound of calcium carbonate to every 17-pounds of titanium dioxide,

C. bringing the solution to a boil while agitating to obtain a homogeneous solution,

D. vaporizing the volatile materials until residue is syrupy (pliable),

E. adding about 2-pounds of sodium bicarbonate to every 13-pounds of liquid formula used,

F. adding water,

G. decanting the resulting solution after the reaction has gone to completion,

H. leaching the material in acids and water,

I. drying the resultant residue,

J. smelting the remaining material to produce titanium metal.

3,912,499

PROCESS FOR OBTAINING METALS FROM ORES OR CONCENTRATES

Maurice Coiffier, Paris, France, and Andre Montaron, deceased, late of Ozoir-la-Ferriere, France (by Christiane Charles, administrator), assignors to Compagnie Generale d'Electrolyse du Palais, Paris, France

Filed Aug. 6, 1973, Ser. No. 385,657

Claims priority, application France, Aug. 8, 1972, 72.28618

Int. Cl.² C22B *1/24, 15/00*

U.S. Cl. 75—3 **3 Claims**

1. A method for the treatment of ores or concentrates containing iron and a metal less oxidizable than iron, with the metals being in at least partially oxidized form, comprising the steps of forming agglomerates of the ore or concentrate with a reducing agent, with the reducing agent being present in an amount sufficient to reduce all said metal and a portion of the iron to the metallic state, introducing the agglomerates to the upper portion of a shaft furnace while heating and introducing an oxygen-containing gas to the lower portion, with the temperature in the upper portion of the furnace being sufficient to commence reaction between said reducing agent and said metal to reduce the less oxidizable metal and a portion of the iron, maintaining the temperature in the lower portion of the furnace higher than that in said upper portion of the furnace, causing the agglomerates to descend in the furnace to initiate melting and formation of molten droplets of the less oxidizable metal charged with iron, reacting the iron with the oxygen-containing gas introduced at the lower portion of the furnace to selectively oxidize the iron and form iron oxides without reoxidizing said metal before the droplets reach the bottom of the furnace, and separating said metal in molten form.

3,912,500
PROCESS FOR PRODUCING DIAMOND-METALLIC MATERIALS

Leonid Fedorovich Vereschagin, Kutuzovsky prospekt 2/1, kv.231; Aik Akopovich Semerchian, Kutuzovsky prospekt, 2/1, kv. 205, both of Moscow; Vitaly Pavlovich Modenov, ulitsa Tsentralnaya 10, kv. 47, Moskovskaya oblast; Tamara Timofeevna Bocharova, Shkolnaya ulitsa 6, kv. 16, Moskovskaya oblast, and Mikhail Eremeevich Dmitriev, ulitsa Shkolnaya, 4, kv. 64, Moskovskaya oblast, all of U.S.S.R.

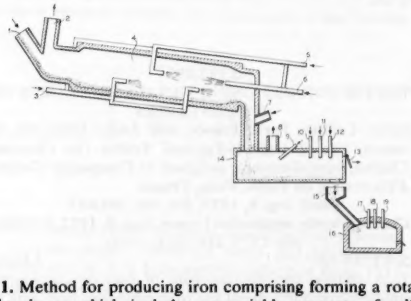
Continuation of Ser. No. 319,048, Dec. 27, 1972, abandoned.
This application Oct. 26, 1973, Ser. No. 409,944
Int. Cl. B22f *3/16*
U.S. Cl. 75—201 **10 Claims**

1. A process for producing diamond-metallic materials which comprises: subjecting a system composed of diamond powder and metallic binder to a pressure of at least 10 kbar to thereby closely pack said diamond powder, the metallic binder being disposed as a separate entity in any portion of the diamond powder but in contact therewith while said diamond powder is being packed; and therafter, while maintaining the system with the packed diamond powder under said pressure of at least 10 kbar, simultaneously heating the system to a temperature sufficient for melting said metallic binder, whereby the metallic binder melts and impregnates said diamond powder under said pressure.

3,912,501
METHOD FOR THE PRODUCTION OF IRON AND STEEL

Javier Gonzalez De Castejon, Marques de Riscal No. 10, 4 Madrid, Spain

Continuation-in-part of Ser. No. 142,255, May 11, 1971, abandoned, and Ser. No. 146,981, May 26, 1971, abandoned, and Ser. No. 148,856, June 1, 1971, abandoned. This application May 19, 1972, Ser. No. 255,113
Claims priority, application Spain, June 5, 1970, 380451; May 6, 1972, 402462
Int. Cl.² C21C *5/52*
U.S. Cl. 75—11 **10 Claims**

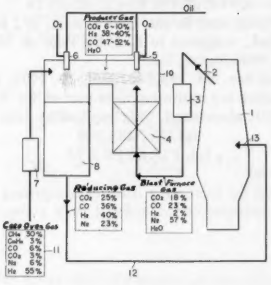


1. Method for producing iron comprising forming a rotary kiln charge which includes appreciable amounts of sulfur contamination and contains iron ore and excess solid carbonaceous reductant; reducing the ore in said charge with said carbonaceous reductant in a rotating kiln; operating said kiln in the substantial absence of added slag-forming materials or with a limited amount of such materials for maintaining an acid condition in the charge as the ore is reduced and removing sulfur from the charge in the form of at least one gaseous oxide of sulfur including SO and SO_2 in the off gases discharged from said kiln; selecting the charge to the kiln, and controlling kiln operating conditions, for inhibiting the formation of sinter or nodules in the kiln effluent for producing, at temperatures in the range of about 600° to about 1300° C and less than the fusion temperature of the ingredients of the rotary kiln charge, a kiln effluent wherein the major solid ingredients are unsintered and unnodulized reduced iron and gangue; maintaining the kiln effluent in the aforesaid temperature range until it has been transferred to a separate melting zone which is connected with the rotary kiln; melting said effluent by contact with gaseous products of combustion of solid carbonaceous fuel and/or fluid fuel; causing the resultant slag to flow upwardly in said melting zone from the melting effluent, while causing the resultant molten iron to settle downwardly therefrom; and recovering the iron from said melting zone in molten form.

3,912,502
METHOD OF PREPARING REDUCING GAS

Tsuneo Miyashita; Toshio Nayuki, both of Kawasaki; Kazuo Sano, Yokohama; Takeo Yamada, Yokohama; Shoichiro Ohzeki, Yokohama, and Hiroaki Nishio, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1974, Ser. No. 432,245
Claims priority, application Japan, Jan. 16, 1973, 48-7243
Int. Cl.² C21B *5/00*
U.S. Cl. 75—42 **5 Claims**



1. A method of preparing reducing gas comprising the steps of

partially oxidizing a hydrocarbon with oxygen or oxygen-rich air to form an intermediate gaseous product containing CO_2 and H_2O, wherein heat is generated, the quantity of oxygen being from 1 to 3 Nm^3/Kg of carbon contained in said hydrocarbon, and

pyrolyzing said intermediate gaseous product and a gaseous hydrocarbon with said heat whereby said CO_2 and H_2O are converted into a reducing gas containing CO and H_2.

3,912,503
GALLING RESISTANT AUSTENITIC STAINLESS STEEL

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignors to Armco Steel Corporation, Middletown, Ohio

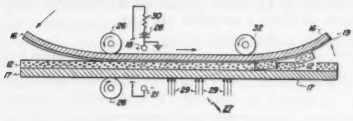
Filed May 14, 1973, Ser. No. 360,402
Int. Cl. C22c *39/26, 39/48*
U.S. Cl. 75—125 **3 Claims**

1. Austenitic stainless steel having excellent resistance against galling, a high work hardening rate, and excellent resistance against pitting corrosion in chloride-containing environments, consisting essentially of from about 12 percent to about 19 percent chromium, about 4 percent to about 12 percent nickel, about 7 percent to about 13 percent manganese, 3 percent to 5 percent silicon, about 0.01 percent to about 0.12 percent carbon, about 0.03 percent to about 0.3 percent nitrogen, about 0.75 percent maximum molybdenum, about 0.75 percent maximum copper, about 0.09 percent maximum phosphorous about 0.05 percent maximum sulfur, and remainder essentially iron except for incidental impurities, all percentages being by weight, the nickel content being varied directly in proportion to the silicon content.

3,912,504
MANIFOLD IMAGING WITH THERMAL ACTIVATOR CONTAINED IN A SILICA GEL LAYER

Joseph M. Kropac, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1974, Ser. No. 435,381
Int. Cl.² G03G *5/00, 13/24, 5/04*
U.S. Cl. 96—1 M **20 Claims**



1. In a manifold imaging member comprising a donor layer, receiver layer, an electrically photosensitive imaging layer and a thermo-activator layer, the improvement wherein said thermo-activator layer is a gel comprising a mixture of finely divided hydrophobic silica and a thermoactivator.

3,912,505
COLOR IMAGING METHOD EMPLOYING A MONOLAYER OF BEADS

William L. Goffe, Webster, and Robert W. Gundlach, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 281,072, Aug. 16, 1972, abandoned, which is a continuation of Ser. No. 679,774, Nov. 1, 1967, abandoned. This application Aug. 29, 1974, Ser. No. 501,571
Int. Cl.² G03G *13/01*
U.S. Cl. 96—1.2 **27 Claims**

1. A color imaging method comprising the steps of:

a. providing an imaging member comprising a supporting substrate, said substrate impermeable to electrically photosensitive particles under the development conditions of step (d) below, an overlayer contacting said substrate consisting essentially of a mosaic pattern having a plurality of contiguous beads of different colors forming a monolayer, each bead comprising electrically photosensitive particles of single color dispersed throughout an electrically insulating softenable material, said softenable material capable of having its resistance to migration of said electrically photosensitive particles decreased sufficiently to allow migration of said electrically photosensitive material through said softenable material toward said substrate;

b. substantially uniformly electrostatically charging said monolayer of beads;

c. exposing said monolayer of beads to an image pattern of polychromatic light; and

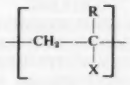
d. developing said member by decreasing the resistance of the softenable material contained in each bead to migration of said electrically photosensitive particles contained in each bead through the softenable material at least sufficient to allow imagewise migration of electrically photosensitive particles through the softenable material toward but not into the substrate.

3,912,506
PHOTOCONDUCTIVE ELEMENTS CONTAINING POLYMERIC BINDERS

Stewart H. Merrill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 21, 1973, Ser. No. 362,601
Int. Cl.² G03G *5/06, 5/08*
U.S. Cl. 96—1.5 **17 Claims**

1. An electrophotographic element comprising an electrically conductive support having coated thereon a photoconductive composition comprising at least about 10 weight percent photoconductor and a polymeric binder having repeating units represented by the following structure:



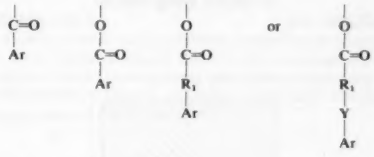
wherein R represents

A. an alkyl group having 1 to 18 carbon atoms,

B. an aryl group, or

C. a hydrogen atom; and

X is a naphthyl-containing moiety having a formula selected from the following:



wherein

R_1 is a lower alkylene group having 1 to 8 carbon atoms,

Ar is a naphthyl group or a substituted naphthyl group wherein the substituents are selected from the group consisting of alkoxy group, aryloxy group, amino group, hydroxy group, alkylamino, arylamino, nitro group, cyano group, halo group, and alkyl group, and

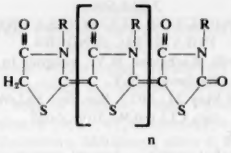
Y is an oxygen atom or a sulfur atom.

3,912,507
POLYRHODANINE PHOTOCONDUCTIVE MATERIALS

Juergen H. H. Keller, Chelmsford, and Robert H. Sprague, Carlisle, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed June 4, 1973, Ser. No. 366,910
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.5 **1 Claim**

1. A photoconductive composition comprising a photoconductive polyrhodanine dispersed in an electrically insulating binder and having a pigment to binder ratio of from about 2/1 to about 1/4, said photoconductive polyrhodanine being represented by the following structural formula:



wherein:
n equal 1, 2, 3 or 4; and,
R represents hydrogen; C_1–C_4alkyl; aryl; or aralkyl.

3,912,508

ELECTROPHOTOGRAPHIC ELEMENT COMPRISING AN ORGANIC PHOTOCONDUCTIVE LAYER SENSITIZED LOCALLY AT ITS SURFACE

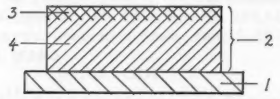
Mitsusuke Ikeda, Hirakata; Hisanao Sato, Ibaragi; Etsuko Torii, Kyoto; Kazuhisa Morimoto, Settsu, and Yo Hasegawa, Suita, all of Japan, assignors to Matsushita Electric Ind., Ltd., Japan

Continuation of Ser. No. 185,657, Oct. 1, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,696

Claims priority, application Japan, Oct. 7, 1970, 45-88433; Oct. 8, 1970, 45-89152; Oct. 8, 1970, 45-89153; Oct. 8, 1970, 45-89154; Oct. 13, 1970, 45-90353

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.6 **4 Claims**



1. An electrophotographic element including a conductive support and an organic photoconductive layer comprising 100 weight parts of a polymer and 0.1 to 10 weight parts of an organic sensitizer, said organic photoconductive layer having a thickness of 5 to 30 microns, said organic sensitizer being distributed locally at the top of said organic photoconductive layer in a layer with a thickness of 0.1 to 1 micron, said polymer comprising a member selected from the group consisting of poly-N-vinylcarbazole, poly-N-alkenylcarbazole, nuclear-substituted poly-N-vinylcarbazole, and mixtures thereof, said organic sensitizer comprising a member selected from the group consisting of pyrylium salts, thiapyrylium salts, carbonium salts, benzopyrylium salts, benzopyrylium salt derivatives, and mixtures thereof.

3,912,509

ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH A PHOTOCONDUCTIVE CARBAZOLE COMPOUND

Wilhelmus Janssens, Aarschot; Jozef Aime Dierckx, Mechelen, and Hendrik Hubert, Wijnegem, all of Belgium, assignors to Agfa-Gevaert, a naamloze vennootschap, Mortsel, Belgium

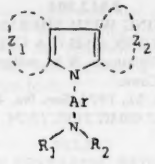
Filed Sept. 21, 1973, Ser. No. 399,503

Claims priority, application United Kingdom, Sept. 22, 1972, 44010/72

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 **8 Claims**

1. A recording process comprising producing by exposure to imagewise modulated electromagnetic radiation a pattern of increased conductivity in a photoconductive insulating recording element comprising an organic photoconductive compound corresponding to the following general formula:



wherein:
each of Z_1 and Z_2 (the same or different) represents the necessary atoms to close a benzene nucleus,
Ar represents a phenylene group,
each of R_1 and R_2 (the same or different) represents hydrogen, an alkyl group, a cycloalkyl group, or a benzyl group.

3,912,510

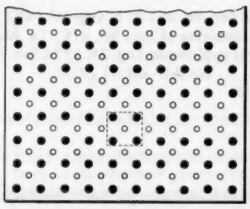
ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A COMPOUND DOCUMENT SCREEN

Lawrence M. Marks, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1973, Ser. No. 408,367

Int. Cl.² G03G *13/04*

U.S. Cl. 96—1 R **10 Claims**



1. In an electrophotographic imaging process comprising the steps wherein an original document is provided at an exposure station, illuminated, and light reflected from said illuminated original document is passed through a lens system and directed onto an electrically photosensitive member, the improvement comprising conducting said imaging process with a compound document screen positioned proximate to the image face of said original document between said document and said lens system, said compound document screen comprising:

a clear transparent substrate material having clear areas and bearing opaque areas;

said opaque areas comprising a repetitive pattern of substantially opaque mixed dots comprising substantially light absorbing like dots and substantially light reflecting like dots;

said like dots arranged with respect to other like dots at an average like dot inch frequency such that the lens system employed in the electrophotographic process passes the fundamental spatial frequencies and attenuates the harmonic spatial frequencies.

3,912,511

MULTICOMPONENT ORGANIC COATING OF POLYESTER, POLYURETHANE AND A HUMIDITY BARRIER THERMOPLASTIC RESIN

Paul L. Gerace, Rochester; Paul R. Handley, Webster, and Rudy H. Haidle, Evanston, all of Ill., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 38,467, May 18, 1970, abandoned. This application Jan. 5, 1973, Ser. No. 321,193

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 **7 Claims**

1. An electrophotographic plate comprising:

a. a photoconductive insulating layer contained on a conductive substrate, and

b. an organic polymer coating composition overlaying the said photoconductive layer, said coating composition comprising from about 16 to 71 percent of a film forming polyester; about 16 to 71 percent of a moisture insensitive, film forming organic solvent soluble thermoplastic resin selected from the group consisting of polyvinyl chloride, polyvinyl fluoride, polyvinylidene chloride, polyisobutylene, and copolymers thereof; and from about 5 to 35 percent of a polyurethane resin, with said polyurethane resin having a volume resistivity of about 10^{11} to 10^{13} ohm-cm.

3,912,512

LIGHT-SENSITIVE DIAZOTYPE FILM AND METHOD OF MAKING AND USING SAME

Charles A. Kumins, Gates Mills, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 4, 1974, Ser. No. 447,743

Int. Cl.[2] G03C *1/74, 1/54, 5/34*

U.S. Cl. 96—49 **18 Claims**

1. A method of making a diazotype copying material having a polyester film substrate comprising the steps of:

a. coating said film with a composition comprising a film forming cellulose ester in the range of from about 15 to 35% by weight, a volatile, water miscible organic solvent, and an aqueous solution containing in the range of from about 0.5 to 3.5% by weight of an inorganic perchlorate selected from the group consisting of sodium and magnesium perchlorate to form perchloric acid;

b. removing a portion only of said solvent by evaporation;

c. contacting said coating with water to remove the remainder of said solvent and to extract at least a portion of said inorganic perchlorate;

d. drying the residue of said coating, thereby providing said film with a porous surface; and

e. applying to said porous surface a sensitizing composition comprising a light sensitive diazonium salt.

6. A method of developing a diazotype copying material having a polyester film substrate, comprising the steps of:

a. coating said film with a composition comprising a film-forming cellulose ester in the range of from about 15 to 35% by weight, a volatile, water miscible organic solvent, and an aqueous solution containing in the range of about 0.5 to 3.5% by weight of an inorganic perchlorate selected from the group of sodium or magnesium perchlorate to form perchloric acid;

b. removing a portion only of said solvent by evaporation;

c. contacting said coating with water to remove the remainder of said solvent and to extract at least a portion of said inorganic perchlorate;

d. drying the residue of said coating, thereby providing said film with a porous surface;

e. applying to said porous surface a sensitizing composition comprising a light sensitive diazonium salt;

f. forming a latent image by exposing said copying material to an actinic radiation pattern corresponding to light and dark areas of the original being copied; and

g. contacting said copying material with a liquid alkaline developer composition to convert said latent image to a visible azo-dye image.

13. A light sensitive diazotype film comprising a polyester base support, a porous subcoat layer formed by applying a coating formulation comprising a film-forming cellulose ester in the range of from about 15 to 35% by weight, a volatile water-miscible organic solvent and an aqueous solution containing in the range of about 0.5 to 3.5% by weight of an inorganic perchlorate selected from the group consisting of sodium and magnesium perchlorate to form perchloric acid, which formulation forms a porous subcoat layer upon the evaporation of the volatile solvents; and a light sensitive two-component diazotype coating applied to said sublayer.

3,912,513

POLYMERIC COMPETING COUPLERS AND THEIR USE IN PHOTOGRAPHIC SILVER HALIDE COLOUR MATERIALS

Marcel Jacob Monbaliu, Mortsel; Gaston Jacob Benoy, Edegem; Raphaël Karel Van Poucke, Berchem, all of Belgium; Wolfgang Sauerteig, Leverkusen; Dieter Stieler, Grobenzell, both of Germany, and Arthur Henri De Cat, Mortsel, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

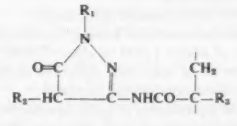
Filed Jan. 11, 1974, Ser. No. 432,533

Claims priority, application Germany, Jan. 30, 1973, 2304319

Int. Cl.[2] G03C *7/00, 1/40*

U.S. Cl. 96—56.5 **8 Claims**

1. A photographic colour element comprising in a lightsensitive silver halide emulsion layer or in a non-lightsensitive hydrophilic colloid layer in water-permeable relationship with the said emulsion layer a polymeric compound comprising recurring units of the formula:



wherein:

R_1 represents an alkyl group or an aryl group,

R_2 represents a C_1-C_5 alkyl group, and

R_3 is hydrogen, C_1-C_4 alkyl or chlorine.

7. Process for the production of a photographic colour image by development of a photographic element containing image-wise exposed silver halide with the aid of a developing agent which by reduction of the exposed silver halide is converted in its oxidized form and as such forms a dye image by coupling with one or more colour forming coupler compounds wherein colour reproduction is improved by coupling of undesirable oxidation products of developing agent with a polymeric compound as defined in claim **1.**

3,912,514

METHOD OF REGENERATING A SPENT PHOTOGRAPHIC SILVER BLEACH SOLUTION

David K. Bulloch, Hillsdale, and Ronald A. Klein, Palisades Park, both of N.J., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Filed May 21, 1973, Ser. No. 362,243

Int. Cl.[2] G03C *5/32;* **C01C** *3/12*

U.S. Cl. 96—60 R **8 Claims**

1. A method of regenerating a photographic aqueous spent silver bleach solution containing an alkali ferrocyanide, said method comprising adding to the silver bleach solution an aqueous solution containing an alkali metal bromite to oxidize ferrocyanide ions to ferricyanide ions, the oxidation being carried out at a pH of between about 6 and about 8 at room temperature.

3,912,515
SILVER HALIDE PHOTOSENSITIVE MATERIAL

Tomio Nakajima; Masashi Nakano; Takashi Uchida, and Kenichi Kishi, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 425,977

Claims priority, application Japan, Dec. 28, 1972, 47-130258

Int. Cl.² G03C *1/84*, *1/40*

U.S. Cl. 96—84 R **3 Claims**

1. In a silver halide photosensitive material comprising a high boiling point solvent for photographic additives, the improvement which comprises said solvent being selected from a group consisting of straight or cyclic, alkanes and alkenes having at least 9 carbon atoms; and cumene, p-cymene, mesitylene, di-isopropyl benzene, n-butyl benzene, sec-butyl benzene, t-butyl benzene, hexyl benzene, cyclohexyl benzene, dodecyl benzene and dephenyl ether.

3,912,516
PHOTOPOLYER COMPOSITION CONTAINING A POLYURETHANE BINDING AGENT

Frank P. Recchia, New Haven, and Tilak M. Shah, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed July 27, 1973, Ser. No. 383,377

Int. Cl.² G03C *1/68*, *5/00*; G03F *7/02*, *8/00*

U.S. Cl. 96—85 **12 Claims**

1. A photopolymerizable composition comprising

a. an addition polymerizable ethylenically unsaturated compound having a boiling point above 100°C at normal atmospheric pressure;

b. a free radical generating addition polymerization initiator activatable by actinic radiation;

c. a compatible polyurethane binding agent comprising the product of reaction of

i. 4,4′-methylenebis(phenyl isocyanate);

ii. a polycaprolactone diol having a molecular weight in the range of about 1,000 to about 2,500; and

iii. a mixture of at least two different aliphatic diols of from 2 to 6 carbon atoms, inclusive;

the ratio of equivalents of polycaprolactone diol (ii) to total equivalents of said aliphatic diols (iii) being within the range of 1:1.5 to 1:7, and the ratio of equivalents of isocyanate (i) to total equivalents of polyols (ii) and (iii) being within the range of about 0.94:1 to 0.98:1.

3,912,517
METHOD OF INCORPORATING PHOTOGRAPHIC INGREDIENTS INTO HYDROPHILIC COLLOIDS

Raphaël Karel Van Poucke, Berchem, and Jaak Pieter Van Vugt, Antwerp, both of Belgium, assignors to Agfa-Gevaert, a naamloze vennootschap, Mortsel, Belgium

Filed Mar. 12, 1974, Ser. No. 450,322

Claims priority, application United Kingdom, Mar. 19, 1973, 13017/73

Int. Cl.² G03C *1/40*

U.S. Cl. 96—100 **11 Claims**

1. In a method of incorporating a photographic ingredient having a solubility in water at 20°C of not more than 3 % by weight into a hydrophilic colloid coating composition for forming a water-permeable colloid layer of a light-sensitive silver halide element, which comprises the steps of dissolving said ingredient in an organic solvent having a solubility in water of at most 25 % by weight at 20°C, admixing the organic solution thus obtained with water in the presence of a surface active agent but in the absence of a hydrophilic colloid, removing said organic solvent forming thereby a dispersion of said ingredient in water and incorporating the dispersion thus formed in said hydrophilic colloid coating composition, the improvement which comprises admixing said organic solution of photographic ingredient with water in the presence of an anionic surface active agent comprising in its molecule a hydrophobic hydrocarbon group of at least 8 C-atoms and a hydrophilic $—SO_3M$ or $—OSO_3M$ group wherein M is hydrogen, an alkali metal atom, ammonium or organic ammonium and a non-ionic surface active hydroxy compound in said proportions that the combined HBL-index of said surface active compounds is comprised between about 8 and about 18.

3,912,518
2-GUANIDINO-4,6-BIS-AMINO-S-TRIAZINES

Denis Varsanyi, Arlesheim, and Willy Roth, Aargau, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

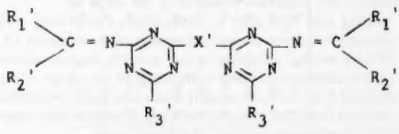
Division of Ser. No. 118,153, Feb. 23, 1971, Pat. No. 3,734,909, which is a continuation-in-part of Ser. No. 672,743, Oct. 4, 1967, abandoned. This application Mar. 14, 1973, Ser. No. 341,016

Claims priority, application Switzerland, Oct. 27, 1966, 15990/66

Int. Cl.² C09G *1/00*, *1/04*, *1/08*, *1/10*

U.S. Cl. 106—3 **7 Claims**

1. A floor-care composition containing as essential ingredients from about 0,2 % - 50 % by weight of a compound which is of the formula



wherein X′ represents one of the following divalent bridging members:

a. — NR — Y — NR —

wherein

Y represents alkylene of from 2 to 6 carbon atoms; alkenylene of from 3 to 6 carbon atoms; cycloalkylene-alkylene wherein the cycloalkylene moiety has from 5 to 8 and the alkylene moiety from 1 to 4 carbon atoms; alkylene-cycloalkylene-alkylene wherein the cycloalkylene moiety has from 5 to 8 carbon atoms and each alkylene moiety has from 1 to 4 carbon atoms, the total number of carbon atoms of the entire bridge member not exceeding 12;

b. — NR — (alkylene-NR)$_n$-alkylene-NR—

wherein

each "alkylene" has from 2 to 6 carbon atoms, and

n represents an integer ranging from 0 to 4;

c. — NR — phenylene — NR —

d. — NR — phenylene — alkylene — NR —

wherein

the alkylene moiety has at most 4 carbon atoms;

e. — NR — alkylene — phenylene — alkylene — NR—

wherein

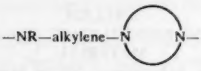
each alkylene moiety has at most 4 carbon atoms;

R in each of the foregoing bridging members representing hydrogen or alkyl of at most 4 carbon atoms; or

f. a divalent heterocyclic radical of the formula

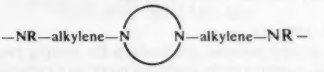
which consists, apart from the two nitrogen atoms, of from 3 to 5 methylene groups as ring members, said methylene groups being unsubstituted or substituted by alkyl of at most 4 carbon atoms;

g. a divalent heterocyclic radical of the formula



which consists, apart from the two nitrogen atoms, of from 3 to 5 methylene groups as ring members, said methylene groups being unsubstituted or substituted by alkyl of at most 4 carbon atoms;

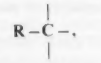
h. a divalent heterocyclic radical of the formula



which consists, apart from the two nitrogen atoms, of from 3 to 5 methylene groups as ring members, said methylene groups being unsubstituted or substituted by alkyl of at most 4 carbon atoms; or

i. a divalent heterocyclic radical of the formula

which consists, apart from the nitrogen atom, and the group



of from 3 to 5 methylene groups as ring members, said methylene groups being unsubstituted or substituted by alkyl of at most 4 carbon atoms, and

R having the same meaning as above; any substituent of the aforesaid cycloalkylene, aromatic and heterocyclic moieties and bridge members being an alkyl group of at most 4 carbon atoms; and

each of R_1', R_2' and R_3' represents a mono- or disubstituted amino group, the substitution of which is selected from alkyl of from 1 – 22 carbon atoms, and alkenyl of from 1 –22 carbon atoms, at least one of the aforesaid amino substituents in R_1', R_2' or R_3' being alkyl or alkenyl having from 6 – 22 carbon atoms; pyrrolidino; piperidino; piperazino; 4-lower alkyl-piperazino; morpholino; thiomorpholino; hexahydroazepino or hexahydrodiazepino, and an addition salt of said compound with an acid or with a quaternizing agent, and diluting adjuvant compatible with said compound, in sufficient amount for permitting uniform distribution of said agent on surfaces to be treated herewith, selected from

i. a solid macromolecular compound which is filmforming by about 1 to 5% of its weight of a plasticizer, and which has a 20°C a Tukon hardness of at most 10,

ii. a hard resin which has at 20°C a Tukon hardness above 10, and such component (a) or (b) plasticized with a plasticizer selected from from a liquid organic compound which has, at 20°C a viscosity ranging from 52–100,000, a melting point below 15°C, and a solid plasticizer having a penetration index between 1 and 80 at 20°C, and a melting point above 40°C,

iii. a cationic emulsifying agent,

iv. a non-ionic emulsifying agent, and

V. mixtures of at least two of said components (i) through (iv).

3,912,519

ANTI-FOULING SHIP BOTTOM PAINT

Isamu Takagi, Amagasaki; Seishi Kawanishi, Takarazuka, and Yoshihiko Nishizawa, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 29, 1974, Ser. No. 437,630

Claims priority, application Japan, Feb. 1, 1973, 48-13441

Int. Cl.² C09D *3/40, 5/14, 5/16, 5/18*

U.S. Cl. 106—15 AF **7 Claims**

2. An anti-fouling ship bottom paint according to claim **1**, wherein R represents tertiary butyl or amyl.

3,912,520

WRITING INK FOR WRITING BOARDS

Tamotsu Miyajima, Oiso; Shigekazu Enami, Hiratsuka; Takamaru Murai, Kariya, and Katsuhiko Kobayashi, Chigasaki, all of Japan, assignors to The Pilot Pen Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 173,287, Aug. 19, 1971, abandoned, which is a continuation of Ser. No. 786,744, Dec. 24, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,512

Claims priority, application Japan, Dec. 29, 1967, 43-84258

Int. Cl. C09d *11/16*

U.S. Cl. 106—22 **10 Claims**

1. An ink for application to a substantially impermeable writing surface consisting essentially of

at least one solvent dye substantially insoluble in water and not substantive to the writing surface,

at least one hygroscopic salt selected from the group consisting of salts each of whose saturated aqueous solution produces in the surrounding atmosphere a relative humidity of less than 40 percent at a temperature of 20° centigrade, and

at least one solvent for the dye and the salt, said solvent containing at least 70 percent by weight of at least one volatile alcohol having a vapor pressure at 20° centigrade between about 4 mmHg and about 70 mmHg,

there being between about 4 and about 10 parts of the dye and between about 3 and about 8 parts of the salt per 100 parts by weight of the solvent.

3,912,521

SYNTHETIC CRYSTAL AND METHOD OF MAKING SAME

Carl F. Cline, Mendham, N.J., and David A. Patterson, Danville, Calif., assignors to Creative Crystals, Inc., San Ramon, Calif.

Filed Apr. 30, 1973, Ser. No. 355,385

Int. Cl.² C04B *35/00*

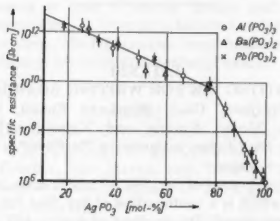
U.S. Cl. 106—42 **11 Claims**

1. A synthetic gem-like crystal simulating the color change characteristic of natural alexandrite when illuminated by daylight and by tungsten light, characterized in that the crystal is grown on a chrysoberyl seed in a melt containing a flux material, a nutrient material having beryllium and alumina therein and dopant material containing iron and chromium, with the iron in the melt being in the range of approximately 0.07% to 3.0% by weight of the melt and the chromium in the melt being in the range of approximately 0.0000685% to 0.5130% by weight of the melt, the iron in the crystal being in the range of approximately 0.07% to 4.89% by weight of the crystal and the chromium in the crystal being in the range of approximately 0.0342% to 2.052% by weight of the crystal.

3,912,522
SILVER CONTAINING, SEMICONDUCTIVE GLASS OF IMPROVED RESISTIVITY AND SECONDARY EMISSION AND PROCESS OF MAKING IT

Hans-Herbert Kaes, Wetzlar-Dorlar, and Hans Staaden, Stockhausen, both of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Jan. 25, 1974, Ser. No. 436,666
Claims priority, application Germany, Jan. 29, 1973, 2304216
Int. Cl.² C03C *3/00*
U.S. Cl. 106—47 R **20 Claims**



1. A silver-containing, semiconductive glass of high secondary emission and a resistivity between 10^6 and $10^{12}\Omega$cm., consisting essentially of silver metaphosphate, aluminum metaphosphate, and vanadium pentoxide within the following concentration limits:

between about 10.0% and about 80.0%, by weight, of silver metaphosphate $AgPO_3$,

between about 5.0% and about 30.0%, by weight, of aluminum metaphosphate $Al(PO_3)_3$, and

between about 5.0% and about 50.0%, by weight, of vanadium pentoxide V_2O_5.

3,912,523
HEAT RESISTANT PORCELAIN ENAMEL COATINGS CONTAINING VERMICULITE

Richard G. Rion, Parma Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 283,786, Aug. 25, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,747
Int. Cl.² C03C *5/02*
U.S. Cl. 106—48 **2 Claims**

1. A heat resistant porcelain enamel composition, adaptable to be fused to a metallic substrate at from about 1520°F. to 1640°F., consisting essentially of an aqueous slip suspension of:

a. a greater than 100 but less than 650 parts by weight exfoliated, powdered vermiculite,

b. 100 parts by weight of an alkali silicate based porcelain enamel frit,

c. from 0 to 6 parts by weight of enameling clay,

d. from 0 to 2 parts by weight electrolyte,

e. from 0 to ½ parts by weight floating agent,

f. from 100 to 600 parts by weight water, the foregoing components of said slip present as a ball milled interspersion therethroughout.

3,912,524
SPONTANEOUS OPAL GLASSES

James E. Flannery, and Dale R. Wexell, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,078
Int. Cl.² C03C *1/04, 3/04, 3/10*
U.S. Cl. 106—52 **10 Claims**

1. An essentially boron-free and fluorine-free spontaneous opal glass consisting essentially, in percent by weight on an oxide basis, of 65–80% SiO_2, 2–12% Al_2O_3, 0.5–5% Li_2O, 5–16% R_2O, wherein R_2O consists of Na_2O and/or K_2O and wherein at least 5% Na_2O is present in the absence of BaO, 1.2-4% RO_3, wherein RO_3 consists of 1.2–4% MoO_3, 1.6–4% WO_3, or mixtures thereof at least equivalent to 1.2% MoO_3, and 0–10% BaO, the glass having as its predominant opacifying phase a crystal selected from the group consisting of sodium molybdate, sodium tungstate, barium molybdate, barium tungstate, and mixtures thereof.

3,912,525
LITHIOMZINC BOROSILICATE GLASS SEALING MATERIAL

Marc Monneraye, Aubervilliers; Michel Monnier, Paris, and Jacques Lantaires, Massy, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 210,353, Dec. 21, 1971, abandoned. This application Mar. 13, 1974, Ser. No. 450,725
Claims priority, application France, Dec. 30, 1970, 70.47222; Dec. 30, 1970, 70.47223
Int. Cl.² C03C *3/08, 3/22*
U.S. Cl. 106—54 **2 Claims**

1. A sealing material particularly for sealing two ceramic materials together or for sealing a metal to a ceramic material consisting of a slightly devitrifiable glass which comprises SiO_2, B_2O_3, alkaline earth metal oxides, ZnO and optionally Al_2O_3, said glass consisting essentially of the following ranges of oxidic compositions in mol. %:

SiO_2	4 – 20
B_2O_3	20 – 45
Al_2O_3	0 – 5
Li_2O	5 – 10
ZnO	30 – 55
CaO+SrO+BaO	0 – 10

in which the molar ratio (Li_2O+ZnO+ alkaline earth oxides): (SiO_2+B_2O_3+Al_2O_3) is equal to or more than 1.

3,912,526
REFRACTORIES

Norman Owen Clark, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, England

Filed Oct. 1, 1973, Ser. No. 402,381
Claims priority, application United Kingdom, Oct. 5, 1972, 46071/72
Int. Cl.² C04B *35/04, 35/10, 35/48*
U.S. Cl. 106—55 **13 Claims**

1. In a process for producing a refractory material in which an aqueous suspension of a raw material is dewatered and the dewatered solid thus obtained is calcined to form the desired refractory, the improvement which comprises dewatering the aqueous suspension of the raw material at a pressure which is greater than 700 lbs per square inch gauge.

3,912,527
BARIUM TITANATE BASE CERAMIC COMPOSITION HAVING A HIGH DIELECTRIC CONSTANT

Kazuaki Utsumi; Norio Tsubouchi, and Tomeji Ohno, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 22, 1974, Ser. No. 453,998
Claims priority, application Japan, Mar. 24, 1973, 48-33896; May 9, 1973, 48-51996; Feb. 20, 1974, 49-20303; Feb. 22, 1974, 49-21225
Int. Cl.² C04B *35/46;* **H01B** *1/08*
U.S. Cl. 106—73.32 **8 Claims**

3. A dielectric ceramic composition, having a high dielectric constant, consisting of 77.5 to 99.79 mol % of $BaTiO_3$ as a basic constituent, 0.5 to 5.0 mol % of Nb_2O_5 as a sub constituent, and 0.05 to 5.0 mol % of at least one of the compounds In_2O_3, Ga_2O_3, and Tl_2O_3 as another sub constituent.

3,912,528
ADDITIVES TO IMPROVE FROTHING AGENTS IN GYPSUM BOARD MANUFACTURE

Robert B. Doan, Drexel Hill; Robert C. Taylor, King of Prussia, both of Pa., and Max H. Reynolds, Homewood, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 179,170, Sept. 9, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 390,154

Int. Cl.² B32B *5/20;* **C04B** *11/14*

U.S. Cl. 106—111 **12 Claims**

1. A frothed gypsum slurry wherein the frothing agent comprises:

a. 20 to 70 weight per cent alkyl benzene sulfonate having a branched or linear side chain with an average carbon content ranging from 6 to 15 and a maximum carbon number spread of 8,

b. 5 to 40 weight per cent of a compound having between 2 and 9 carbon atoms selected from the group consisting of monohydric alcohols, glycols, glycol ethers, ketones, and mixtures thereof, and

c. 0 to 75 weight per cent water.

3,912,529
GLYOXAL COMPOSITION

Yasuo Kotani, Hirakata, and Kunio Kageyama, Amagasaki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1974, Ser. No. 434,339

Claims priority, application Japan, Jan. 19, 1973, 48-9049; Feb. 1, 1973, 48-13929; Apr. 14, 1973, 48-42610; July 9, 1973, 48-77651; July 13, 1973, 48-79549

Int. Cl.² C08L *3/04*

U.S. Cl. 106—187 **4 Claims**

1. A non-fluid glyoxal composition comprising glyoxal, water and at least one member selected from the group consisting of polyvinyl alcohol, water-soluble polyvinyl alcohol derivatives and water-soluble cellulose derivatives; the ratio of glyoxal and the water-soluble polymeric material being in the range of about 1 : 2 to about 50 : 1 and water being in the range of about 5 to about 90% by weight in the composition.

3,912,530
WATER RESISTANT CORRUGATING ADHESIVE COMPOSITION

Camillus B. Musselman, Chesterfield, and Edward M. Bovier, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 264,868, June 21, 1972, abandoned. This application June 7, 1974, Ser. No. 477,325

Int. Cl.² C09D *3/20;* **C08L** *3/02*

U.S. Cl. 106—213 **5 Claims**

1. A water resistant adhesive suitable for making heavy weight and multiwall board at faster than normal rates comprising:

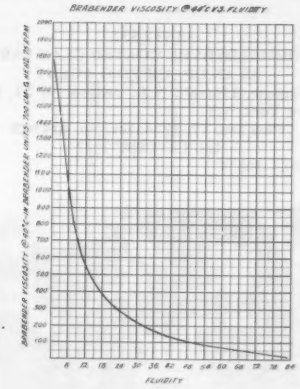
a. about 3 to about 12% gelatinized starch solids of which about 25 to 100% is waxy starch modified to increase the fluidity thereof to the range of 25 to about 90 mls measured at 25°C.,

b. about 10 to about 35% raw starch solids,

c. about 0.1 to about 1.0% NaOH,

d. about 1 to about 20% of a water resistant material by weight of the starch, and

e. about 60 to about 85.9% water, said percent being by weight based on the final adhesive mix, the amount of gelatinized starch solids being such as to provide an increased amount of cooked starch solids as compared with conventional corrugating adhesives, the viscosity of said adhesive being 16 to 120 seconds on the brass cup at 105°F., and the waxy starch being modified to allow said



increased amount of cooked solids while retaining the viscosity of the adhesive.

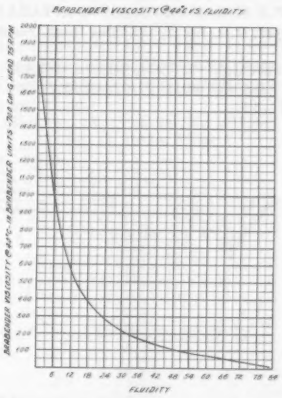
3,912,531
CORRUGATING ADHESIVE COMPOSITION

Camillus B. Musselman, Chesterfield, and Edward M. Bovier, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 264,868, June 21, 1972, abandoned. This application June 7, 1974, Ser. No. 477,326

Int. Cl.² C09D *3/20;* **C08L** *3/02*

U.S. Cl. 106—213 **4 Claims**



1. A corrugating adhesive suitable for making heavy weight and multiwall board at faster than normal rates comprising:

a. 3 to 12% gelatinized starch solids of which 25 to 100% is waxy starch modified to increase the fluidity thereof to the range of 25 to about 90 mlls. measured at 25°C.,

b. 10 to 35% raw starch solids,

c. 0.1 to 1.0% NaOH, and

d. 60 to 86.9% water, said percent being by weight based on the final adhesive mix, the amount of gelatinized starch solids being such as to provide an increased amount of cooked starch solids as compared with conventional corrugating adhesives, the viscosity of said adhesive being 16 to 120 seconds on the brass cup at 105°F., and the

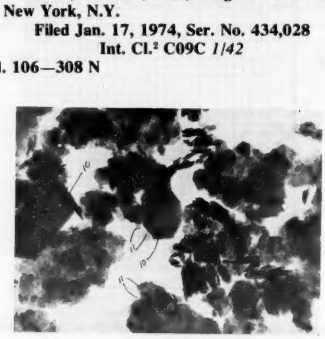
waxy starch being modified to allow said increased amount of cooked solids while retaining the viscosity of the adhesive.

3,912,532

UREA-FORMALDEHYDE COATED CLAY PARTICLES, AS AN OPACIFYING AGENT

Dominic Simone, Lincroft, N.J., assignor to NL Industries, Inc., New York, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,028
Int. Cl.² C09C *1/42*
U.S. Cl. 106—308 N **1 Claim**



1. An opacifying agent for paper comprising plate-like clay particles coated with a polymeric resin of urea-formaldehyde, said coated particles having a size range from 0.2 to 10.0 μ, said clay particles having a size range from 0.1 to 8.0 μ, and said coating comprising urea-formaldehyde polymeric particles of size from 0.1 to 0.8 μ, said urea-formaldehyde coating being present in amount from 5 to 96% by weight based on the total weight of the coated particles.

3,912,533

MAPLE SUGAR PROCESSING APPARATUS

Jerre P. Heyer, R.D. No. 3, Williams Road, North East, Pa. 16428

Filed July 12, 1974, Ser. No. 487,877
Int. Cl.² B01D *21/02;* **C13F** *3/00*
U.S. Cl. 127—13 **9 Claims**

1. A separator for removing maple sugar sand from maple sap comprising,

a tank,

said tank having two sides, a first end and a second end, and a bottom,

spaced weir members attached to said bottom and to said sides and terminating below the upper edge of said sides and defining spaced compartments therebetween,

an inlet pipe connected to one said first end and terminating adjacent the bottom of said tank between said first end and the said weir adjacent thereto,

spaced baffles attached to said sides and extending downwardly from the upper edge of said sides and between said weirs to a position above the said bottom,

each said spaced baffle being disposed substantially midway between each two adjacent said weirs,

a first deflection baffle attached to each said weir adjacent the upper edge of each said weir,

said deflection baffles each extending downwardly and away from the top edge of the weir to which it is attached, a second deflection baffle fixed to one of said weirs on the side opposite said first deflection baffle and below said first deflection baffle and above said bottom,

a third deflection baffle attached to each said downwardly extending spaced baffle and extending downwardly and toward said next end at substantially the same level as said second baffles,

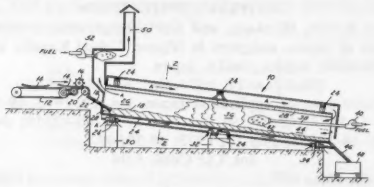
a trough extending transversely of said tank at substantially the level of the top of said weirs whereby liquid flows progressively from said inlet over the top edge of said weirs from said inlet, under said first spaced baffles and flows to said outlet from said trough.

3,912,534

METHOD OF RECOVERING GLASS CULLET

Daniel J. Gurta, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1974, Ser. No. 534,511
Int. Cl.² B08B *7/00*
U.S. Cl. 134—19 **3 Claims**



1. A method of recovering glass cullet from laminated glass scrap which comprises the steps of:

crushing the laminated glass scrap to fragment the glass although it generally remains in bonding contact with a laminating interlayer;

slowly raising the temperature of the crushed laminated scrap;

mixing the crushed laminated scrap as its temperature is increased so that the laminating interlayer softens thereby permitting the interlayer to be torn thus reducing the size of individual portions of the laminated scrap to a finely divided state;

heating the finely divided crushed laminated scrap to a temperature at which the interlayer material is substantially removed from the crushed scrap;

burning away any carbon residue left on the crushed scrap after the interlayer material has been removed;

cooling the crushed scrap; and

recovering the crushed scrap for use as cullet.

3,912,535

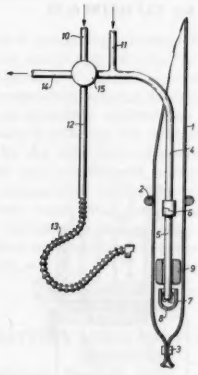
APPARATUS AND METHOD FOR THE CLEANING AND STERILIZING OF FILLER PIPES IN PACKING MACHINES

Jan Axel Ingemar Rausér, Lomma, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Aug. 27, 1973, Ser. No. 391,555
Claims priority, application Sweden, Sept. 22, 1972, 12224/72
Int. Cl.² B08B *9/02;* **B65B** *31/00*
U.S. Cl. 134—22 C **3 Claims**

1. A method for cleaning and sterilizing a filler pipe of a packaging machine in which the filler pipe includes a lower portion separable from an upper portion thereof and includes

fluid withdrawing means detachably connectable to the lower end of the upper portion of the filler pipe when the lower portion thereof is removed therefrom, said machine including means for forming a longitudinal tube of a packaging material to surround the lower end of the filler pipe and means for transversely sealing said tube after filling with a filling material, said method comprising, in sequence, attaching the fluid withdrawing means to the lower end of the upper portion of the filler pipe before operating the machine and before the longitudinal tube reaches the lower end of the upper portion of the filler pipe, circulating a cleaning agent through said upper portion and the fluid withdrawing means, removing the withdrawing means, attaching the lower portion of the filler pipe to the lower end of the upper portion of the filler pipe,



starting operation of the machine to advance the packaging material to form the longitudinal tube and the transverse seal across the longitudinal tube below the lower open end of the lower portion of the filler pipe, introducing a gaseous sterilizing agent into the upper portion of the filler pipe and directing the gaseous sterilizing agent as it flows out of the lower end of the lower portion of the filler pipe backwardly along the outside of the portions of the filler pipe to sterilize the outside walls of the filler pipe, venting the gaseous sterilizing agent through the upper opening formed by the packaging material immediately preceding formation of the longitudinal tube, and stopping introduction of the gaseous sterilizing agent so that filler material may be introduced into the cleaned and sterilized filler pipe.

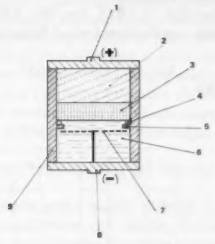
3,912,536

NEGATIVE ELECTRODE FOR SOLID ELECTROLYTE CELLS

Riccardo Galli, and Franco Olivani, both of Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 237,758, March 24, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,427
Claims priority, application Italy, Mar. 27, 1971, 22390/71
Int. Cl.² H01M *35/00*
U.S. Cl. 136—6 R **12 Claims**

1. An electrochemical cell consisting essentially of:
an alkali metal negative electrode,
an oxidizing material positive electrode, and
an electrolyte in the solid state interposed between said negative electrode and said positive electrode,



wherein said negative electrode is a solution of an alkali metal in one or more aprotic organic solvents.

3,912,537

ELECTRIC STORAGE BATTERY GRIDS

Kenneth Peters, Worsley, England, assignor to Electric Power Storage Limited, London, England

Filed Mar. 7, 1974, Ser. No. 448,757
Claims priority, application United Kingdom, Mar. 15, 1973, 12573/73
Int. Cl.² H01M *4/38*
U.S. Cl. 136—26 **9 Claims**

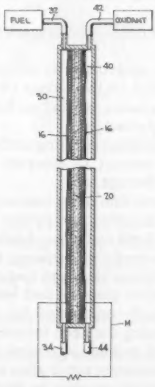
1. An electric storage battery grid made from an alloy consisting essentially of: 0.1 to 4 wt. percent antimony, 0.25 to 0.5 wt percent arsenic, up to 0.1 wt percent copper, up to 0.5 wt percent sulfur, up to 0.5 wt percent tin, 0.002 to 0.5 wt percent selenium, and the balance being lead, trace elements and impurities, wherein said amounts of selenium and arsenic cooperate to overcome cracking of said grid and maintain a satisfactory level of hardness while cooperating with antimony to achieve improved castability and corrosion resistance.

3,912,538

NOVEL COMPOSITE FUEL CELL ELECTRODE

George H. Dews, Glastonbury, and Fred S. Kemp, Rockville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 15, 1974, Ser. No. 433,447
Int. Cl. H01m *27/04*
U.S. Cl. 136—86 D **7 Claims**

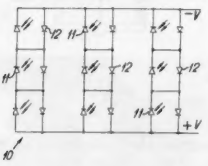


1. A trilayer electrode comprising a continuous carbon fiber substrate, a graphite-hydrophobic polymer sublayer partially impregnated into said fiber substrate, and a catalyst-hydrophobic polymer layer on said sublayer.

3,912,539
SOLAR CELLS

Vincent Magee, Stockport, England, assignor to Ferranti, Limited, Hollinwood, England

Filed Feb. 2, 1973, Ser. No. 329,075
Claims priority, application United Kingdom, Feb. 3, 1972, 5110/72
Int. Cl.² H01L *31/00*
U.S. Cl. 136—89 **13 Claims**



1. A semiconductor device for an array of solar cells comprising in a semiconductor body a combination of a solar cell and a protective diode having a common region of one conductivity type and isolated regions of opposite conductivity type, said regions being of the P and N type, said solar cell being defined by a first radiation sensitive P-N junction within the semiconductor body, said protective diode being defined by a further P-N junction within said semiconductor body, means for isolating the radiation sensitive P-N junction of the solar cell from the P-N junction of the protective diode, said solar cell and said protective diode each include a contact on the surface of isolated regions of the semiconductor body and a contact on the common region of the semiconductor body, and said first radiation sensitive P-N junction being co-planar with the P-N junction of the protective diode.

3,912,540
COVERED SILICON SOLAR CELLS AND METHOD OF MANUFACTURE

Jacob D. Broder, Cleveland Heights, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation-in-part of Ser. No. 154,930, June 21, 1971, abandoned. This application June 18, 1973, Ser. No. 371,322
Int. Cl.² H01L *31/04, 21/312*
U.S. Cl. 136—89 **5 Claims**

1. A covered solar cell for use in space consisting essentially of

a wafer of silicon semiconductor material,

an electrical contact on the surface of said wafer,

an antireflective coating on said surface of said wafer and said electrical contact,

a transparent cover glass covering said surface of said wafer and electrical contact to dissipate heat and minimize bombardment damage, and

a transparent plastic film of an interpolymer of tetrafluoroethylene and hexafluoropropylene having a thickness between about 1 mil and about 2 mils between said cover glass and said antireflective coating, said copolymer being bonded to said cover glass and said antireflective coating to bind said cover glass to said wafer, said copolymer being substantially unaffected by ultraviolet radiation thereby eliminating the need for ultraviolet filters.

3. In a method of making a covered solar cell for use in space wherein a transparent cover glass is attached to a wafer of silicon semiconductor material to dissipate heat and minimize bombardment damage, the improvement comprising the steps of

placing a transparent plastic film of an interpolymer of tetrafluoroethyelene and hexaflurorpropylene between said wafer of silicon semiconductor material and said transparent cover glass,

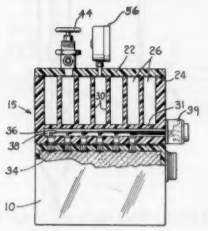
heating said assembled wafer, interpolymer of tetrafluoroethylene and hexafluoropropylene film, and transparent glass cover to a temperature of about 550° F, and

applying a pressure of about 15 psi at said temperature to said assembly to bond said transparent cover glass to said wafer.

3,912,541
RAPID ACTIVATION AND CHECKOUT DEVICE FOR BATTERIES

William J. Britz, Huntsville, and William A. Boshers, Madison, both of Ala., assignors to The United States of America as represented by the United States Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed June 27, 1974, Ser. No. 483,857
Int. Cl.² H01M *6/30*
U.S. Cl. 136—90 **6 Claims**



1. An apparatus for activating a battery by inserting an electrolyte into the cells thereof while concurrently making voltage measurements on each cell, said battery having a planar top with vertically extending passages extending therethrough providing access to cells of said battery, electrically conductive test points provided on said battery for each of said cells, said apparatus comprising:

a. an enclosed housing containing said electrolyte which is to be inserted into said cells for activating said cells;

b. said enclosed housing having a planar bottom so that said housing can be positioned on said planar top of said battery;

c. tubular members carried in said bottom of said housing for conveying said electrolyte from said housing to said cells of said battery;

d. means for providing a sealed coupling between said tubular members and passages when said housing is positioned on said battery;

e. a plurality of downwardly extending electrical test probes carried by said bottom of said housing for engaging said test points on said battery; and

f. electrical connector means coupled to said electrical test probes for conveying voltage signals from said test probes external of said housing;

whereby concurrently with said electrolyte being supplied to said cells from said housing electrical voltage measurements can be made of each cell.

3,912,542
METHOD OF PRODUCING LAMINATED SHEET-LIKE MATERIAL

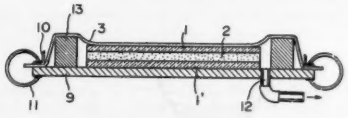
Jiro Hirano, Kobe, and Toshio Yamada, Nishinomiya, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed June 29, 1973, Ser. No. 374,889

Claims priority, application Japan, June 30, 1972, 47-66158; Oct. 17, 1972, 47-104299; Mar. 19, 1973, 48-32110; Mar. 27, 1973, 48-35387

Int. Cl.[2] B32B *5/16, 17/10, 31/20*

U.S. Cl. 156—104 **13 Claims**



1. A method of producing a laminated sheet-like material, which comprises interposing an adhesive layer composed of a preformed air-permeable sintered sheet of a powdery thermoplastic resin composition between at least two sheet-like materials to form an assembly, maintaining the assembly under reduced pressure to deaerate the adhesive layer and to press the assembly by the difference of pressure between the reduced pressure and atmospheric pressure, and heating the assembly at a temperature higher than the softening point of the thermoplastic resin, while maintaining the reduced pressure during at least the initial stage of heating thereby to melt the sintered sheet and bond the sheet-like materials to provide an integral body.

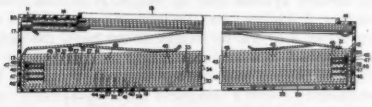
3,912,543
PLANAR BATTERY AND A PHOTOGRAPHIC FILM ASSEMBLY

Robert M. Delahunt, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 4, 1974, Ser. No. 439,349

Int. Cl. H01m *21/04*

U.S. Cl. 136—111 **31 Claims**



1. A planar battery which comprises, in combination and in superposed relationship, electrical energy generating components including:

a. a planar anode and a planar cathode superposed substantially coextensive the anode, at least one of the anode and the cathode including an electrically conducting thermoplastic layer;

b. a planar separator positioned intermediate and extending substantially coextensive the facing surfaces of the anode and the cathode including marginal portions and an aqueous electrolyte permeable central portion;

c. an aqueous electrolyte disposed in the central portion of the separator and in contact with the facing surfaces of the anode and the cathode;

d. an electrically nonconducting adhesive layer extending intermediate and securing the marginal surfaces of the separator to the contiguous facing surfaces next adjacent; and

e. an electrically nonconducting insulator layer extending intermediate the adjacent marginal surface portions of the anode and cathode layer thermostable at the temperature at which the thermoplastic layer softens.

21. A photographic film assembly which comprises, in combination:

a. a photographic film cassette adapted for enclosing a plurality of planar photographic film units arranged in stacked relationship and including a forward wall possessing a light-transmitting section to provide for exposure of the forwardmost film unit and a withdrawal opening in one wall of the container permitting selective withdrawal of the film units following exposure thereof;

b. a plurality of photographic film units disposed in stacked relationship within the cassette next adjacent the forward wall; and

c. a planar battery positioned in the cassette and including, in combination:

i. a planar anode and a planar cathode superposed substantially coextensive the anode, at least one of the anode and the cathode including an electrically conductive thermoplastic layer;

ii. a planar separator positioned intermediate and extending substantially coextensive the facing surfaces of the anode and the cathode including marginal portions and an aqueous electrolyte permeable central portion;

iii. an aqueous electrolyte disposed in the central portion of the separator and in contact with the facing surfaces of the anode and the cathode;

iv. an electrically nonconducting adhesive sealant extending intermediate and coextensive the marginal surfaces of the separator and securing the separator to the contiguous facing surfaces of the anode and the cathode; and

v. an electrically nonconducting insulator layer extending intermediate the adjacent marginal surface portions of the anode and cathode thermostable at temperatures at which the thermoplastic layer softens.

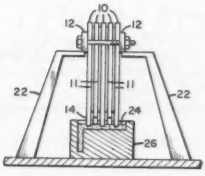
3,912,544
METHODS FOR MOUNTING BATTERY PLATES

Anthony Sabatino, St. Paul, Minn., assignor to Gould, Inc., Chicago, Ill.

Filed Nov. 12, 1969, Ser. No. 875,781

Int. Cl. H01m *35/32*

U.S. Cl. 136—134 R **5 Claims**



1. A process for casting battery plates onto a connection strap comprising the successive steps of:

holding and aligning a stack of battery plates and separators;

dipping the connecting lugs of said plates in said stack into a flux solution;

dipping the connecting lugs of said plates in said stack into a solder bath;

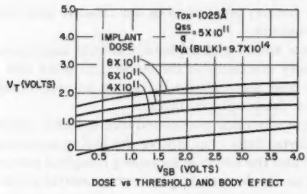
casting a connecting strap with molten lead;

immediately immersing the connecting lugs of said plates into said molten lead after leaving said solder bath; and holding the stack in the immersed position until the lugs of said plates are cast onto the solidified connecting strap.

3,912,545
PROCESS AND PRODUCT FOR MAKING A SINGLE SUPPLY N-CHANNEL SILICON GATE DEVICE

William E. Armstrong, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed May 13, 1974, Ser. No. 469,487
Int. Cl.[2] H01L 21/265
U.S. Cl. 148—1.5 16 Claims



DOSE vs THRESHOLD AND BODY EFFECT

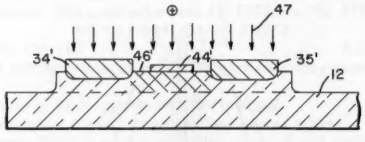
1. A process for increasing the threshold voltage of an N-channel MOS device comprising the step of:

implanting acceptor ions of one conductivity type into the channel surface portion of channel region of a semiconductor body having source and drain regions of the opposite type conductivity at an energy level and in an amount sufficient to increase the threshold voltage of said MOS device.

3,912,546
ENHANCEMENT MODE, SCHOTTKY-BARRIER GATE GALLIUM ARSENIDE FIELD EFFECT TRANSISTOR

Robert G. Hunsperger, Malibu, and Nathan Hirsch, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 6, 1974, Ser. No. 530,117
Int. Cl.[2] H01L 21/263
U.S. Cl. 148—1.5 12 Claims



1. A process for fabricating an enhancement mode Schottky-barrier gate field effect transistor comprising the steps of:

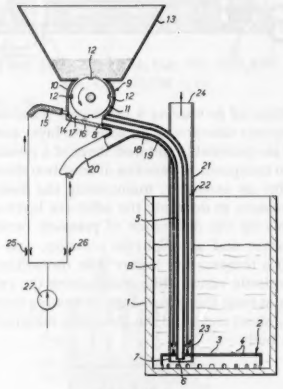
a. forming source, gate and drain electrodes on a channel layer of a field effect transistor (FET) structure, with said gate electrode permitting protons to pass therethrough, and

b. bombarding said gate electrodes and said channel layer with protons of predetermined energy and dosage, whereby said source and drain electrodes mask out protons from entering said field effect transistor structure, while said protons penetrate through said gate electrode and the exposed portion of said channel layer to thereby lower the conductivity of said channel layer by a predetermined amount and establish a cutoff condition for a zero gate voltage and a given source-to-drain voltage applied to said field effect transistor.

3,912,547
METHOD OF TREATMENT OF FERROUS METAL PARTS TO INCREASE THEIR RESISTANCE TO WEAR AND SEIZURE

Antoine Gaucher, St-Etienne, and Gérard Guilhot, St-Jean Bonnefonds, both of France, assignors to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, Andrezieux-Boutheon, France

Filed Feb. 8, 1973, Ser. No. 330,646
Claims priority, application France, Feb. 18, 1972, 72.05498; Nov. 29, 1972, 72.42350; Jan. 23, 1973, 72.02212
Int. Cl.[2] C23C 1/10
U.S. Cl. 148—6.11 7 Claims



1. A method of treating machine parts of ferrous metals so as to form thereon a white microlayer of at least nitrides and carbides of iron, comprising the steps of immersing the parts to be treated in a bath of molten salts at a temperature between **450°** and **600°C.** containing **1-35%** carbonate ions by weight, **20-65%** cyanate ions by weight, potassium ions, sodium ions and lithium ions, the lithium being present in an amount about **4** to **6%** by weight of the bath, the ratio by weight of lithium to sodium being **0.15** to **0.50** and the ratio by weight of lithium to potassium being **0.10** to **0.35,** for a time sufficient to form a said white microlayer.

3,912,548
METHOD FOR TREATING METAL SURFACES WITH COMPOSITIONS COMPRISING ZIRCONIUM AND A POLYMER

Harry L. Faigen, Philadelphia, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

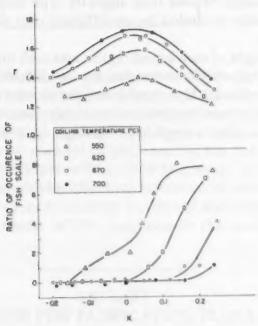
Filed July 13, 1973, Ser. No. 379,138
Int. Cl.[2] C23C 1/10
U.S. Cl. 148—6.15 R 8 Claims

1. A process for treating a metallic surface to improve the corrosion resistance and the siccative finish bonding characteristics of said surface, comprising contacting the metallic surface with an aqueous composition consisting essentially of a soluble zirconium compound in an amount of from about 0.1 grams/liter to about 3.5 grams/liter, measured as ZrO_2, and a polymeric material in an amount from about 0.1 grams/liter to about 5.0 grams/liter, wherein the said zirconium compound is selected from the group consisting of ammonium carbonate and ammonium fluozirconate and the polymeric material is selected from the group consisting of polyacrylic acid, esters, and salts thereof.

3,912,549
METHOD FOR MANUFACTURING A STEEL FOR ENAMELING

Hisashi Gondo; Hiroshi Takechi; Mitsunobu Abe, and Kazuo Namba, all of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed June 28, 1973, Ser. No. 374,390
Claims priority, application Japan, June 30, 1972, 47-65752
Int. Cl.[2] C21D 9/46
U.S. Cl. 148—12 C 5 Claims



1. A method for the manufacture of a cold-rolled low-carbon steel sheet used for porcelain enamel having excellent press formability and suitability for enameling which comprises: providing a low carbon steel material having not more than 0.25% by weight of manganese; said steel material containing Mn, O and S in the relation of

$$-0.20 \quad [Mn\%]-\frac{AW \text{ of } Mn}{AW \text{ of } O}\times[O\%] \quad \frac{AW \text{ of } Mn}{AW \text{ of } S}\times[S\%] \quad 0$$

where AW — atomic weight; subjecting said steel material to hot rolling followed by coiling the same at 600℃ to 800℃; subjecting said coiled hot rolled strip to cold rolling to thereby obtain a cold rolled strip; and thereafter subjecting said cold rolled strip to recrystalization annealing.

3,912,550
FLUX FOR SOFT SOLDERS

Hans-Eckhard Bolte, and Klaus-Lothar Schubert, both of Wuppertal, Germany, assignors to Stannol-Lotmittelfabrik Wilhelm Paff, Wuppertal, Germany

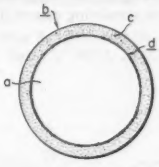
Filed Aug. 7, 1973, Ser. No. 386,351
Claims priority, application Germany, Sept. 2, 1972, 2243374
Int. Cl.[2] B23K 35/362
U.S. Cl. 148—23 14 Claims

11. A flux according to claim 1, wherein R_2 and R_3 are aliphatic hydrocarbon radicals having from 1 to 6 carbon atoms.

3,912,551
PIN FOR A STEEL CHAIN

Kumakichi Araya, No. 2 Daishoji Seki, Ishikawa, Kaga, Japan

Filed Oct. 11, 1973, Ser. No. 405,852
Claims priority, application Japan, Oct. 31, 1972, 47-108522
Int. Cl.[2] C22C 38/18
U.S. Cl. 148—31.5 2 Claims

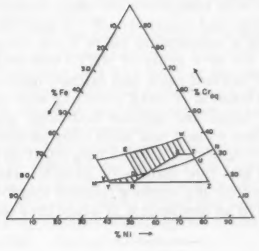


1. A steel chain link cylindrical pin comprised of an alloy of iron and from 0.23 to 0.5% of a medium carbon, and having a surface layer which is at least 3μ in thickness of ferrite having hard, fine and globular chrome carbide particles dispersed therein.

3,912,552
OXIDATION RESISTANT DISPERSION STRENGTHENED ALLOY

Jay Ward Schultz, and Howard Francis Merrick, both of Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 254,106, May 17, 1972, abandoned. This application Apr. 27, 1973, Ser. No. 354,674
Int. Cl. C22c 19/00
U.S. Cl. 148—31 21 Claims



1. An age-hardenable dispersion-strengthened alloy consisting essentially of, by weight, about 15 to about 50% iron, about 4 to about 6% metallic aluminum, about 10 to about 30% chromium, up to about 1% titanium and the balance essentially nickel, the weight percents of said nickel and said iron and the chromium equivalent, calculated as the weight percent of chromium plus 6 plus the weight percent of aluminum minus 3, plus the weight percent of titanium, being so correlated as to fall within the area equivalent to that defined by E-W-T-S-R-Y-V-D-E in FIG. 4, and further comprising a refractory dispersoid in a small but effective amount for improved strength, said dispersoid having a fine particle size.

3,912,553
PRESS FORGING DIE

George M. Waid, Williamsfield, and Robert T. Ault, Shaker Heights, both of Ohio, assignors to A. Finkl & Sons Company, Chicago, Ill.

Filed Oct. 10, 1973, Ser. No. 405,165
Int. Cl.² C22C 38/44, 38/46
U.S. Cl. 148—38 10 Claims

1. A press forging die block for shaping hot metal work pieces, said press forging die block being austenitized and having a hardness of at least about 40 Rc after temper aging at least 4 hours in the range of 900° to 1150°F, and a room temperature tensile strength of at least about 150,000 psi, said press forging die block consisting essentially of

C	.15 – .35
Mn	.50 – .90
Si	.15 – .40
Ni	1.0 – 3.5
Cr	.5 – 4.5
Mo	.5 – 3.0
V	.2 – 1.0
Al	.01 – .07
Fe	balance, together with non-deleterious elements.

3,912,554
RECOVERY OF RARE-EARTH ALLOY PARTICLES FROM CALCIUM-CONTAINING PRODUCT USING AQUEOUS AMMONIUM CHLORIDE

Ronald H. Arendt, and Theodore B. Lerman, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 24, 1974, Ser. No. 482,590
Int. Cl.² H01F 1/02
U.S. Cl. 148—105 2 Claims

1. A process for recovering rare earth alloy particles having useful magnetic properties from a material comprised of calcium hyroxide, calcium oxide and rare earth alloy particles, said calcium hydroxide and calcium oxide being present in an amount ranging from about 10% to 30% by weight of said rare earth alloy particles, said rare earth alloy particles having an average size less than 40 microns and consisting essentially of rare earth metal and a metal selected from the group consisting of cobalt, iron, manganese and alloys thereof which comprises admixing said material with an aqueous solution of NH_4Cl having a temperature below room temperature and having from 2.1 to 3 moles of NH_4Cl dissolved therein for each mole of calcium oxide and calcium hydroxide present, said aqueous solution of NH_4Cl reacting with and dissolving said calcium oxide and calcium hydroxide and having no significant effect on said rare earth alloy particles, said reaction having no significant deteriorating effect on the magnetic properties of said rare earth alloy particles, recovering said alloy particles from the resulting reaction solution, and drying said particles in an atmosphere in which they are inert.

3,912,555
SEMICONDUCTOR INTEGRATED CIRCUIT AND METHOD FOR MANUFACTURING THE SAME

Tadaharu Tsuyuki, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 18, 1973, Ser. No. 398,398
Claims priority, application Japan, Sept. 22, 1972, 47-95341
Int. Cl. H01l 7/36, 7/44, 27/02
U.S. Cl. 148—175 3 Claims

1. A method for the manufacture of a semiconductor integrated circuit comprising:

a. taking a semiconductor substrate of a first impurity type;

b. forming by diffusion a first layer on said substrate over one major surface thereof of the opposite impurity type from that of said substrate;

c. forming a highly doped island region of said opposite impurity type and a highly doped ring shaped region of said opposite impurity type by diffusion in said first layer, said island region and said ring shaped region being laterally spaced from each other and extending through said first layer and partially into said substrate;

d. forming by diffusion a highly doped isolation ring of said first impurity type around said island region and spaced therefrom;

e. forming by diffusion around said ring shaped region a highly doped isolation ring and in laterally spaced position therefrom;

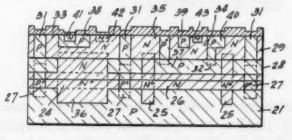
f. said isolation rings extending completely through said first layer and into said substrate;

g. depositing by an epitaxial technique a first epitaxial layer of said first impurity type and then by continuing epitaxial growth depositing a second epitaxial layer of said opposite impurity type;

h. the height of said first impurity type isolation ring being upwardly extended by up-diffusion into said first epitaxial layer;

i. the height of said island region and said ring shaped region being upwardly extended by up-diffusion through said first epitaxial layer and into said second epitaxial layer;

j. further extending the extent of said isolation rings so that they extend completely through said first and second



epitaxial layers by downward diffusion from the outer surface of said second epitaxial layer, the last said down diffusion being of said first impurity type and of less doping concentration than that of said isolation rings in said first diffusion layer;

k. the length of said ring shaped region being extended upwardly by up diffusion from said ring shaped region through said first epitaxial layer and into said second epitaxial layer;

l. diffusing a second ring shaped region of said first impurity type through said second epitaxial layer and into said first epitaxial layer and of smaller diameter than that of said first ring shaped region;

m. diffusing a second island region of said first impurity type partially into said second epitaxial layer from its outer surface which is of smaller lateral extent than said first island region and located thereabove;

n. diffusing a third island region of said first impurity type into said second epitaxial layer inside of said second ring shaped region;

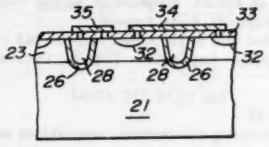
o. diffusing a fourth island region of said second impurity type partially into said second island region; and

p. providing electrode connections to said first, second, third and fourth island regions, to the region of said second epitaxial layer lying within said second ring shaped region, and to the portion of said first epitaxial layer lying below said second ring shaped region.

3,912,556
METHOD OF FABRICATING A SCANNABLE LIGHT EMITTING DIODE ARRAY

Lawrence A. Grenon, Phoenix, and Michael G. Coleman, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 194,609, Oct. 27, 1971, Pat. No. 3,737,704. This application Mar. 5, 1973, Ser. No. 337,818
Int. Cl.² H01L *21/20, 21/76, 33/00*
U.S. Cl. 148—175 **5 Claims**

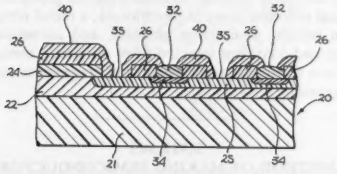


1. A method of manufacturing a monolithic light emitting diode display comprising depositing an epitaxial layer of a first conductivity semiconductor material upon the substrate, etching a channel through said epitaxial layer to the substrate to form a plurality of parallel ridges, coating the surface of the channels and the ridges with a dielectric layer, and diffusing an opposite conductivity effecting material into epitaxial layer in a plurality of spaced locations in each of said ridges to form an orthagonal matrix of PN junctions in the surface of the epitaxial layer.

3,912,557
METHOD FOR FABRICATING PLANAR SEMICONDUCTOR DEVICES

Arthur K. Hochberg, Torrance, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed May 2, 1974, Ser. No. 466,212
Int. Cl.² H01L *21/385*
U.S. Cl. 148—187 **13 Claims**



1. A method of fabircating a semiconductor electrical translating device having at least three active regions therein comprising the steps of:

a. providing a silicon wafer of a first electrical conductivity type, said wafer having disposed therein adjacent a surface a region of a second electrical conductivity type opposite to that of said first electrical conductivity type;

b. disposing a first passivating layer upon said wafer adjacent said surface;

c. forming a plurality of openings in said first passivating layer whereby said surface is exposed;

d. disposing a second passivating layer upon said first passivating layer whereby said first passivating layer and the plurality of openings therein are convered;

e. forming openings through said second passivating layer adjacent some, but not all, of said openings in said first passivating layer whereby said surface is exposed;

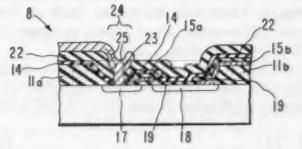
f. forming a layer of silicon upon said second passivating layer and in said openings therethrough such that polycrystalline silicon is formed on said second passivating layer and pseudocrystalline silicon is formed in said openings; and

g. etching said layer of silicon util substantially all of said layer of polycrystalline silicon disposed upon said second passivating layer is removed whereby said pseudocrystalline silicon remains substantially in place.

3,912,558
METHOD OF MOS CIRCUIT FABRICATION

Robert L. Luce, Los Altos Hills; Joseph P. Perry, Sunnyvale, and James D. Sansburry, Palo Alto, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 3, 1974, Ser. No. 466,566
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **11 Claims**



1. The method of manufacturing an MOS device comprising the steps of:

forming a first layer of insulating material on a selected surface of a substrate of semiconductor material;

removing a portion of said first layer of insulating material from a selected region on the surface of said substrate;

forming a second layer of insulating material within said selected region;

forming electrically conductive material in selected patterns over the top surfaces of said first layer of insulating material and said second layer of insulating material thereby to leave exposed selected portions of said second layer of insulating material;

removing said selected portions of said second layer of insulating material to thereby expose the top surfaces of the regions of said semiconductor material underlying said selected portions;

forming a layer of first selected material on the top surfaces of said regions of semiconductor material, said conductive material and said first layer of insulating material, said first selected material containing a dopant for the formation of source and drain regions in said regions of said semiconductor material;

forming source and drain regions in said semiconductor material by diffusing the dopant from said first selected material into said regions of said semiconductor material; removing selected portions of said first selected material from said top surfaces of said regions of said semiconductor material;

forming a third layer of insulating material on the surface of said semiconductor material and said first layer of insulating material, said third layer of insulating material being formed beneath the remaining portions of said first selected material;

forming a fourth layer of insulating material over the exposed top surfaces of the remaining portions of said first selected material;

forming openings for electrical connections through said fourth layer of insulating material to expose selected portions of the top surfaces of said source and drain regions;

heating said substrate and the attached materials to smooth the edges of said openings thereby to prevent electrical connections which will cross said edges from cracking, and simultaneously to form a relatively thin region of an oxide of the dopant used to form said source and drain

regions on the exposed selected portions of the top surfaces of said source and drain regions;

converting said oxide of the dopant to a second selected material while simultaneously converting shallow surface layers of said source and drain regions to lightly-doped material of opposite conductivity type to the conductivity type of said source and drain regions, said lightly-doped material possessing an etch rate relatively higher than the etch rate of the insulating material remaining on said substrate; and,

removing said second selected material from the surfaces of said source and drain regions exposed by said openings thereby to allow electrical contact to be made to said source and drain regions.

3,912,559

COMPLEMENTARY MIS-TYPE SEMICONDUCTOR DEVICES AND METHODS FOR MANUFACTURING SAME

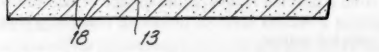
Hiroshi Harigaya; Motoyoshi Sakamoto, both of Suwa, and Masao Kanai, Shimosuwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 309,858, Nov. 27, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,707

Claims priority, application Japan, Nov. 25, 1971, 46-94705

Int. Cl.² H01L *21/225*

U.S. Cl. 148—187 **31 Claims**



1. The method of forming an enhancement-type complementary MIS semiconductor device comprising forming a P^- layer on the surface of an N-type silicon single-crystal substrate having a specific resistance of more than 30 ohms-cm and a crystal orientation characterized as "**100**"; forming source and drain diffusion layers in spaced relation in both said P^- layer portion of the surface of said substrate and the portion of said substrate surface outside of said P^- layer by means of masking and diffusion layers; removing all of said maskins and diffusion layers from the surface of said substrate; washing said substrate surface to remove impurities penetrating into said substrate; forming a silicon oxide film on said washed substrate surface; forming a silicon nitride film on the surface of said silicon oxide film; forming a further silicon oxide film on the surface of said silicon nitride film; forming openings in said silicon oxide and silicon nitride films to expose a portion of the surface of said substrate at each of said sources and drains and the surface of said silicon nitride layer in the gate regions of the device; and forming electro-conductive elements in engagement with each of said sources, drains and exposed silicon nitride film layers to define source, drain and gate electrodes for said semiconductor device, whereby the absolute value of the threshold voltage in both the P- and N-channels of said device does not exceed 1.2 volts.

3,912,560

THIN LAYER PROPAGATING SLURRY EXPLOSIVE

Charles D. Forrest, Hollister, Calif., assignor to Teledyne McCormick Sleph, Hollister, Calif.

Filed Jan. 31, 1974, Ser. No. 434,754

Int. Cl.² C06B *31/32*

U.S. Cl. 149—47 **1 Claim**

1. A thin layer propagating slurry explosive comprising a mixture consisting of, by weight:

A. 40% sensitive fine particle penetaerythritol tetranitrate (PETN);

B. 50% of a 60% ammonium nitrate solution;

C. 9.5% diethylene glycol;

D. 0.5% guar; and

E. 5 drops/100 g slurry of a 50% solution of titanium antimonium lactate in deionized water as a cross-linking agent.

3,912,561

PYROTECHNIC COMPOSITIONS FOR GAS GENERATION

Bernard J. Doin, Saint Medard en Jalles, and Jean P. Thomas, Paris, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Oct. 9, 1973, Ser. No. 404,762

Claims priority, application France, Oct. 17, 1972, 72.36738

Int. Cl.² C22C *37/00*

U.S. Cl. 149—35 **12 Claims**

1. A gas-generating pyrotechnic composition, which comprises:

a. a fuel selected from the group consisting of alkali metal azides and alkaline earth metal azides,

b. an alkali metal oxidant selected from the group consisting of alkali metal perchlorates and bichromates,

c. a nitrogenous compound selected from the group consisting of aminotetrazole, aminotetrazole hydrate, azodicarbonamide and azotetrazole.

3,912,562

LOW TEMPERATURE GAS GENERATOR PROPELLANT

Eugene F. Garner, Saugus, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 395,481, Sept. 10, 1973, Pat. No. 3,901,747. This application Aug. 26, 1974, Ser. No. 500,810

Int. Cl.² C06B *33/14*

U.S. Cl. 149—41 **7 Claims**

1. A pyrotechnic composition adapted, upon combustion, for generating a low temperature, substantially non-toxic gas, said composition comprising: a fuel selected from the group consisting of a carbonaceous material, aluminum and magnesium; an inorganic oxidizer selected from the group consisting of a metal chlorate, a metal perchlorate, a metal nitrate, ammonium nitrate, ammonium chlorate, and ammonium perchlorate; and a coolant selected from the group consisting of magnesium hydroxide and a mixture of magnesium carbonate and magnesium hydroxide.

3,912,563

METHOD OF MAKING SEMICONDUCTOR PIEZORESISTIVE STRAIN TRANSDUCER

Tatsuyuki Tomioka, and Noboru Yukami, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed June 5, 1974, Ser. No. 476,620

Claims priority, application Japan, June 11, 1973, 48-66668; June 11, 1973, 48-69689; Aug. 29, 1973, 48-97480; Oct. 15, 1973, 48-116061

Int. Cl.² H01L *7/50*

U.S. Cl. 156—13 **4 Claims**

1. A method of making strain transducers, which comprises the steps of:

depositing gold films on the opposite face surfaces of a semiconductor wafer;

coating the gold films deposited on the surfaces of the wafer with a photoresist coating;

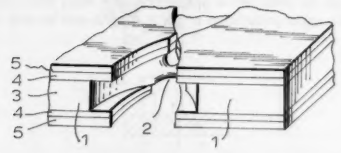
removing the photoresist on the gold films selectively in a pattern of semiconductor strain transducers by a photolithographic process;

dissolving the gold films exposed through the photoresist by immersing the wafer in aqua regia, so that patterns of a

plurality of semiconductor strain transducers is exposed on both surfaces of the wafer;

etching the exposed parts of the wafer to partially remove the material of the wafer at the exposed portions;

removing part of the photoresist so that at least two gold films are exposed which have a plurality of strain transducers extending therebetween;



using the gold films as electrodes, measuring the resistance between the two common gold films, whereby the parallel resistance of the strain transducers is measured; and

stopping the etching of the wafer when the resistance reaches the desired value.

3,912,564

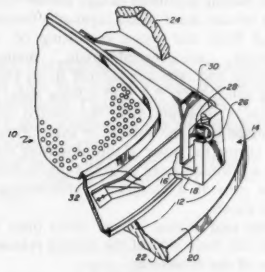
METHOD AND APPARATUS FOR SECURING ELECTRODE-SUPPORTING STUDS ON THE ENVELOPE OF A COLOR CATHODE RAY TUBE

Melvin F. Rogers, Western Springs, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 21, 1973, Ser. No. 427,389

Int. Cl.[2] H01J *29/00*

U.S. Cl. 156—60 **10 Claims**



6. In the manufacture of color cathode ray tubes of the type having a color selection electrode supported in spaced relationship to a faceplate portion of the tube envelope, a method for securing on the envelope studs which are employed in supporting the electrode, comprising:

gripping the studs with respective jigs;

by the use of an alignment fixture, positioning and holding the jigs on an inner surface of the envelope at the intended locations of the studs to temporarily support the studs at the precise intended locations thereof;

securely adhering the jigs to the envelope inner surface by the use of an air-hardenable, room temperature cement such that the studs are accurately and firmly held at said precise locations;

removing the alignment fixture;

locating between the studs and the envelope inner surface a cement of a type which cures at high temperature;

baking the faceplate with the jigs attached to cure the high temperature cement and thereby permanently affix the studs to the envelope; and

breaking loose and removing the jigs from the envelope to leave the studs permanently cemented to the envelope.

3,912,565

METHOD OF PREPARING SHIRRED, ELASTIC, FLEXIBLE ARTICLES

Walter T. Koch, and Robert F. Gillespie, both of Havertown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 24, 1972, Ser. No. 220,147

Int. Cl.[2] B29C *27/00*

U.S. Cl. 156—85 **9 Claims**

1. A method of preparing a shirred, elastic, flexible article including the steps of disposing in direct contact with at least one side of a flexible sheet material a thin layer of flexible, uniaxially oriented, heat-set polyurethane material with the axis of orientation of such layer extending substantially parallel to the desired direction of article shirring, attaching the sheet material and the layer of polyurethane material together without relaxing the uniaxial orientation such layer, thereafter heating the layer of polyurethane material to a temperature above its heat-setting temperature to release the orientation therein, and permitting such layer of polyurethane material to shrink during the heating thereof to thereby effect shirring of the sheet material attached thereto.

3,912,566

METHOD FOR BONDING SURFACES TOGETHER USING A MIXTURE OF AN EPOXIDE RESIN, A POLY(AMINOAMIDE) AND BLOCKED ISOCYANATE PREPOLYMER

Christopher Michael Andrews, Cambridge; Bryan Dobinson, Duxford; Edward William Garnish, Saffron Waldon; Bernard Peter Stark, Stapleford, and Robert George Wilson, Cambridge, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,864

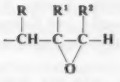
Claims priority, application United Kingdom, Sept. 18, 1972, 43190/72

Int. Cl. C09j *5/00;* **B32b** *27/38*

U.S. Cl. 156—330 **10 Claims**

1. A method for bonding surfaces together which comprises (i) sandwiching between, and in contact with, the surfaces a tacky adhesive composition comprising

a. an epoxide resin having, per average molecule, more than one 1,2-epoxide group of formula



directly attached to oxygen, sulfur, or nitrogen, where either R and R^2 each represent hydrogen, in which case R^1 denotes hydrogen or methyl, or R and R^2 together represent $—CH_2C-H_2—$, in which case R^1 denotes hydrogen,

b. a poly(aminoamide), and

c. 15 to 150 parts by weight of a blocked isocyanate prepolymer per 100 parts by weight of the epoxide resin, said prepolymer being of the formula

$$(OCNR^3NHCOX)_nR^4$$

where

n is 2 or 3,

R^3 is an alkylene, cycloalkylene, arylene, aralkylene or cycloalkylalkylene group,

X denotes sulfur or oxygen, and

R^4 is the residue, after removal of n OH or N SH groups, of a compound having, directly attached to aliphatic carbon atoms, n hydroxyl groups or n mercaptan groups and having a molecular weight of at least 200 and at most 5000, blocked by monohydric phenol or a mono- or di-mercaptan, and

ii. allowing the composition to cure.

3,912,567

STABILIZED NONWOVEN WEB AND METHOD OF PREPARATION

Robert J. Schwartz, Winneconne, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 14, 1973, Ser. No. 359,673

Int. Cl.[2] D04H *3/16*

U.S. Cl. 156—167 **10 Claims**

1. A process for stabilizing a nonwoven web of molecularly oriented crystallizable thermoplastic fibers, said web having a basis weight of at least about 1 oz./yd.[2] and containing fibers having a crystallinity below the equilibrium value, said process consisting essentially of compressing in the absence of any preheating step said web in intermittent regions under a pressure of at least about 2000 psi. to effect fiber deformation within said regions and substantially instantaneously raising the temperature of the areas of the web defining the surfaces of the compressed regions to effect fiber fusion of the surface fibers before crystallinity is substantially increased, to combined effects of fiber deformation within the compressed regions of the web and fiber fusion on the surfaces thereof providing desirable two-sided abrasion resistance and strength characteristics.

5. In a process for preparing a continuous filament having a crystallinity below about 45 percent web of polypropylene filaments comprising extruding polypropylene through a multiple number of downwardly directed spinning nozzles in the form of filaments, pneumatically melt drawing the filaments at a velocity of at least 3000 meters/min. followed by rapid quenching and collection as a continuous filament web having a basis weight of at least about 1 oz./yd.[2], the improvement wherein the continuous filament web is thereafter stabilized by compressing in the absence of any preheating step said web in intermittent regions under a pressure of at least about 2000 psi. to effect filament deformation within said regions and substantially instantaneously raising the temperature of the areas of the web defining the surfaces of the compressed regions to effect filament fusion of the surface filaments before crystallinity is substantially increased, the combined effects of filament deformation within the compressed regions of the web and filament fusion on the surfaces thereof providing desirable two-sided abrasion resistance and strength characteristics.

3,912,568

METHOD OF MANUFACTURING DRUMS OF METAL CANS

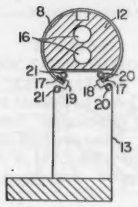
Hiroshi Ueno, Kawasaki; Fumio Kawasaki, Yokohama; Minoru Sasaya, Kawasaki, and Kazuo Okubo, Tokyo, all of Japan, assignors to Toyo Seikan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 839,461, July 7, 1969, abandoned. This application Mar. 21, 1972, Ser. No. 236,401

Int. Cl. B29d *23/10*

U.S. Cl. 156—203 **4 Claims**

1. A method for the mass production at a high velocity of can bodies from a metallic blank including the successive steps of bonding a layer of a crystalline thermoplastic resinous adhesive having a self-diffusion coefficient exceeding $6.0 \times 10^{-21} cm^2/sec$ onto opposed longitudinal edges of a substantially flat can body blank, shaping the blank into substantially cylindrical form with the opposed longitudinal edges separated from each other, applying heat from within the shaped blank to the opposed longitudinal edges of the body blank so as to elevate the temperature of said adhesive to at least the melting point of said adhesive, confronting and superimposing said longitudinal edges between a cooled hammer and mandrel upon said temperature elevation so as to cause said heated adhesives of said longitudinal edges to confront each other and then driving the hammer towards the mandrel so



that the layers are strongly pressed together and at the same time the heat contained in the layers is removed from the hammer and mandrel by thermal conduction whereby the layers are cooled and solidified and fully bonded together, with the time required for the superimposing, pressing and cooling being effected within 200 milliseconds per can body.

3,912,569

COATING SUBSTRATE WITH THERMOSETTING RESIN CONTAINING PRINTED DESIGN

Ales M. Kapral, Menasha, Wis., assignor to Akrosil Corporation, Menasha, Wis.

Filed Feb. 27, 1974, Ser. No. 446,271

Int. Cl.[2] B44C *1/24*

U.S. Cl. 156—230 **6 Claims**

1. A method of coating a substrate with a layer of a thermosetting resin having a printed design therein comprising:

coating a release sheet with a layer of a thermosetting resin selected from the group consisting of: melamine-formaldehyde, urea-formaldehyde, melamine-urea-formaldehyde and mixtures thereof in an amount of 0.2–6 pounds solids/1000 ft.[2], said release sheet being strippable from a substrate after the coated release sheet is hot-pressed onto the surface of said substrate;

partially curing the layer of thermosetting resin;

applying a printed design onto the thermosetting resin surface to provide a designed thermosetting resin coated release sheet;

positioning said coated release sheet onto a substrate to contact the resin side of the coated release sheet with a surface of the substrate;

hot-pressing the coated release sheet against the substrate surface to thermoset the resin layer and adhere the resin layer to the substrate; and

stripping the release sheet from the surface of the resin coated substrate to provide a designed coating layer of a thermosetting resin not containing a paper overlay sheet as the first substrate layer.

3,912,570

APPARATUS FOR ATTACHING SELF-ADHESIVE PERFORATED EDGING STRIPS TO UNPERFORATED SHEET MATERIAL, MORE PARTICULARLY DRAWING COPY MASTERS

Werner Schweisfurth, Siegen, Germany, assignor to Meteor-Siegen, Siegen, Germany

Filed Aug. 2, 1973, Ser. No. 385,212

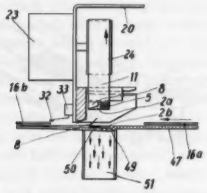
Claims priority, application Germany, Aug. 3, 1972, 2238118

Int. Cl.[2] B65C *9/42*

U.S. Cl. 156—351 **5 Claims**

1. Apparatus for attaching self-adhesive, perforated edging strips to unperforated sheet material such as drawing copy masters, comprising substantially horizontal conveying means

on which said sheet material moves in a given direction, a storage and supply device for the edging strips which are serially and self-adhesively attached on a support strip in the manner of a belt, means for feeding said edging strips and said support strip over a predetermined path from said storage and supply device substantially to a point of substantially transverse intersection with said conveying means, means for controlling the operation of said feeding means including probes respectively disposed adjacent said conveying means and along said feed path which respond to the feed of the sheet material and of the edging strips, a separating edge adjacent



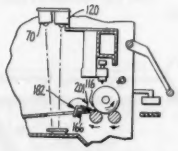
said feed path and over which the feed of said strip is substantially reversed to deflect said support strip, the edging strips continuing in the initial feed separated from said support strips, a stationary inclined perforated plate located opposite the feed means such that the conveying means for the sheet material passes said sheet material between the feed means and said plate and on which said separated edging strips are received and retained by means of suction air, the inclination of said perforated plate being such that its surface inclines from a position removed from the conveying means toward the conveying means in the conveying direction of the sheet material for associating edging strips therewith.

3,912,571

ROLL PRODUCT WITH MANUALLY GRASPABLE TAIL END AND MANUFACTURE THEREOF

Ellsworth A. Hartbauer, Concord, and Henry W. Rehr, Clayton, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed June 3, 1974, Ser. No. 476,017
Int. Cl.² B32B *31/00*
U.S. Cl. 156—351 **12 Claims**



1. Apparatus for securing the unaffixed tail portion of a roll product to a convolution thereof underlying said tail portion comprising:

means for positioning the tail portion of said roll product so that the free end of said tail portion is spaced from a wound portion of said roll product;

means for forming a fold in said tail portion after positioning thereof by said positioning means;

means for actuating said fold forming means to form the fold in said tail portion when the free end of the tail portion is located a predetermined distance from the wound portion of said roll product;

applicator means for applying adhesive onto said roll product at a predetermined location thereon after positioning of said tail portion by said positioning means and the free end of the tail portion is located a predetermined distance from the wound portion of the roll product; and

means for rotating said roll product to wind said tail portion onto said wound portion after formation of said fold whereby said fold is brought into engagement with an underlying roll product convolution and said adhesive is disposed therebetween.

9. Apparatus for forming a manually graspable fold in the tail portion of a roll product comprising:

means for rotating said roll product in a direction tending to wind said tail portion thereabout;

means for positioning the tail portion on a support surface with the free end of said tail portion spaced from a wound portion of said roll product;

means for sensing when the free end of said tail portion passes at least one predetermined location on said support surface as the tail portion is wound about an underlying convolution of said roll product due to rotation of the roll product by said rotating means; and

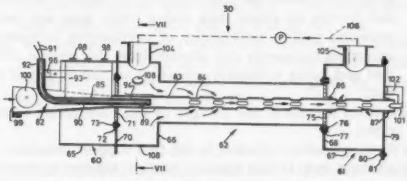
means for forming a fold in said tail portion in operative association with said sensing means and responsive to a determination by said sensing means that the tail end of said tail portion has passed a predetermined location to form a fold in said tail portion comprising at least two manually graspable fold segments, said rotating means winding said fold into engagement with an underlying convolution of said roll product.

3,912,572

METHOD OF AND APPARATUS FOR FORMING ARTICLES OF FIBROUS MATERIALS

John W. Lacon, Sarnia, Canada, assignor to Fiberglas Canada Limited, Toronto, Canada

Filed Mar. 30, 1973, Ser. No. 346,381
Claims priority, application Canada, Feb. 1, 1973, 162625
Int. Cl.² B31F *1/00*
U.S. Cl. 156—381 **51 Claims**



1. Apparatus for forming articles from longitudinally advancing strip-shaped felts of fibrous material containing hardenable bonding material, said apparatus comprising:

a. a stationary guide which, during use of the apparatus, is in direct sliding contact with a longitudinally advancing, strip-shaped felt of fibrous material containing hardenable bonding material, said guide having a transverse shape which varies along said guide for progessively deforming the cross-sectional shape of the felt to facilitate entry of the felt between stationary forming surfaces to be recited hereinafter;

b. stationary forming surfaces spaced apart for receiving the felts therebetween in sliding contact with said forming surfaces at opposite sides of the felt, said stationary forming surfaces being disposed beyond said stationary guide in the direction of advance of the felt;

c. a felt feed mechanism adapted to pull the felt between said stationary forming surfaces, said felt feed mechanism being disposed beyond said stationary forming surface in the direction of advance of the felt;

d. means for discharging hot gas through the thickness of the felt after entry of the felt between said stationary forming surfaces to cure it while it is deformed, said means for discharging hot gas being disposed before said

felt feed mechanism in the direction of advance of the felt; and

e. a cutter for cutting the felt into separate lengths, said cutter being disposed beyond said felt feed mechanism in the direction of advance of the felt.

3,912,573

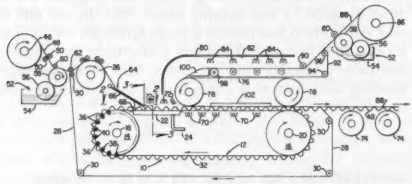
APPARATUS FOR PRODUCING CORE MATERIAL FOR HONEYCOMB PANELS

Bernard P. Kunz, 4981 S. Clarkson St., Englewood, Colo. 80110

Continuation of Ser. No. 166,817, July 28, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,237

Int. Cl.² B31F *1/24;* **B32B** *31/12*

U.S. Cl. 156—471 **7 Claims**



1. Apparatus for producing core material for honeycomb panels from a web of porous fibrous material, comprising:

a corrugator including a pair of longitudinally spaced support members and a corrugating belt, the belt being in the form of an endless loop surrounding the support members and having an upper pass and a lower pass and being provided with a multiplicity of corrugating formations extending outwardly and laterally from side to side of the belt and being uniformly spaced along the length of the belt;

apertures formed in the troughs of the corrugating formations;

a forming station adjacent to the first support member;

a vacuum box at the forming station located below the upper pass of the belt and operating to draw air continuously through the overlying apertures in the belt;

an imperforate support belt in the form of an elongate endless loop of thin, flexible material arranged to overlie the upper pass of the corrugating belt above the vacuum box at the forming station;

means for supplying a first continuous web of porous fibrous material to the support belt to overlie and travel with the support belt;

a first impregnator to apply liquid resin to the fibrous web prior to contact with the support belt;

a reciprocating feeder device underlying the support belt at the forming station to advance and feed successive portions of the support belt and fibrous web into successive corrugating formations on the corrugating belt;

means to move the corrugating belt, the support belt, and the porous fibrous web simultaneously along the corrugator from the forming station to an exit station adjacent to the second support member, so that the vacuum box can pull successive portions of the length of the support belt and the overlying porous fibrous web down into the troughs of the corrugating formations at the forming station to corrugate the web; and

first heating means between the forming station and the exit station to cure the fibrous web and set its corrugations as it proceeds to the exit station.

3,912,574

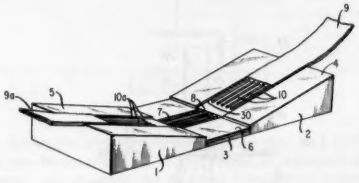
APPARATUS FOR SPLICING PAIRS OF ARRAYED OR INDIVIDUAL FIBERS UTILIZING OPTICAL FIBER ALIGNING GROOVES

Allen Henry Cherin, Doraville, and Philip Jay Rich, Atlanta, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 24, 1974, Ser. No. 517,420

Int. Cl.² B65H *69/06*

U.S. Cl. 156—502 **7 Claims**



1. Apparatus for joining optical fibers of a first linear array in axial alignment with corresponding fibers of a second linear array comprising:

a surface comprising parallel fiber-aligning grooves having the same center-to-center spacing as the fibers of said arrays;

means for advancing the fibers of said first and said second arrays into their respective said grooves toward each other and at a small acute angle with respect to the grooves, thus to generate within each said fiber a downwardly biasing stress when each said fiber contacts its said groove;

said biasing stress maintaining each said fiber in contact with its said groove, the ends of respective corresponding fibers meeting in opposing axial alignment, and

means for securing said fibers in said axial alignment.

3,912,575

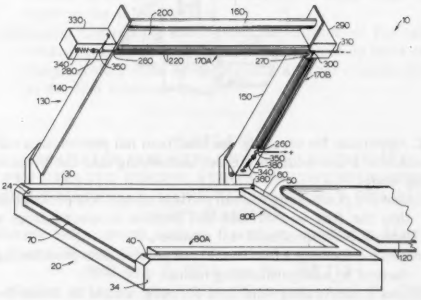
HEAT SEALING APPARATUS USING A WIRE SEALING ELEMENT

Seymour Zelnick, Somerville, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Continuation-in-part of Ser. No. 269,068, July 5, 1972, abandoned. This application June 18, 1973, Ser. No. 370,784

Int. Cl.² B32B *31/20*

U.S. Cl. 156—515 **15 Claims**



1. Heat sealing apparatus comprising

a base providing support for films of material to be sealed together by the application of heat thereto, and

a heat-sealing assembly movable into and out of operative relation with said base and including

a flexible wire sealing member secured to said heat-sealing assembly only at its ends and unsupported between its ends,

said wire sealing member comprising a stranded cable and having terminals at its ends for receiving electrical current for heating said sealing member to red heat.

12. Heat sealing apparatus comprising

a base member providing support for films of material to be sealed together by the application of heat thereto, and

a heat-sealing assembly movable into and out of operative relation with said base and including

a generally U-shaped fixed first member including a base and two legs and having inner walls which define a chamber which extends along the length of said first member, a portion of said inner walls of said chamber including ledges which project into said chamber,

a second elongated generally U-shaped film-clamping member disposed within said chamber and including a base portion and two legs, short projecting walls extending laterally from said legs at said base portion and adapted to seat on said ledges to prevent said second member from falling out of said first member, said legs of said second member being closely-spaced and extending out of said chamber between said legs of said first member, spring means disposed within said chamber in contact with said second member and urging said second member outwardly from said chamber, whereby said second member can bear against and clamp the films being sealed during a sealing operation, and

a flexible wire member for cutting and sealing said films secured to said heat-sealing assembly only at its ends and unsupported between its ends,

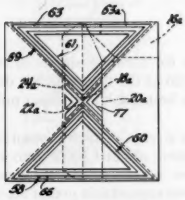
said wire member having terminals at its ends for receiving electrical current for heating it to red heat,

said wire member being disposed between and close to said legs of second member and operable to cut and seal said films.

3,912,576
CARTON SEALING APPARATUS

Eric A. Braun, Northville, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Filed Oct. 22, 1974, Ser. No. 516,949
Int. Cl.² B32B *31/00*; E04B *2/00*
U.S. Cl. 156—580 **5 Claims**

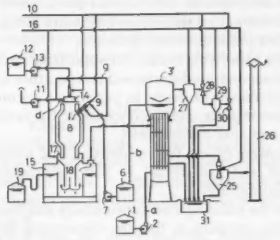


1. A carton sealing vibrating tool for ultrasonically sealing an end closure of a thermoplastic coated paperboard carton comprising: a body having an end surface with a ribbed formation projecting therefrom, said ribbed formation including a pair of oppositely disposed sets of concentric triangular enclosures.

3,912,577
METHOD AND APPARATUS FOR TREATMENT OF LIQUID WASTES

Mikio Akune, Yokosuka, and Kokichi Yoshii, Shibukawa, both of Japan, assignors to Nittetsu Chemical Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 149,667, June 3, 1971, Pat. No. 3,847,713. This application Apr. 5, 1974, Ser. No. 458,064
Claims priority, application Japan, June 20, 1970, 45-55692
Int. Cl.² B01D *1/14, 47/00, 1/16, 1/100*
U.S. Cl. 159—4 A **2 Claims**



1. A method for treating liquid waste, which comprises the steps of:

a. providing a liquid waste containing a combustible mixture or organic and inorganic or organo-metallic materials, said materials after complete combustion producing an alkali metal containing ash;

b. concentrating said waste in an evaporator under reduced pressure;

c. injecting and atomizing the thus concentrated waste into a vertical furnace through a spray nozzle at the upper portion of said furnace;

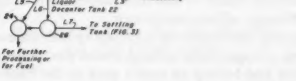
d. combusting said injected and atomized waste in said vertical furnace at least above 800°C and above the fusion temperature of the thus produced ash; and

e. introducing the upper laden combustion gases evolved from said vertical furnace into said evaporator to utilize the heat contained in said combustion gases by indirect heat exchange with said liquid waste.

3,912,578
APPARATUS FOR AND A METHOD OF PURIFYING WASTE FLUID

William J. Didycz, Whitehall Borough, and Donald Glassman, Mount Lebanon Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 325,803, Jan. 22, 1973, abandoned, which is a division of Ser. No. 120,540, March 3, 1971, Pat. No. 3,790,448. This application Aug. 2, 1974, Ser. No. 494,257
Int. Cl.² B01D *1/100, 1/26, 3/02, 3/06*
U.S. Cl. 159—20 R **20 Claims**



11. A backward flow apparatus for the backward flow purification of liqueform waste containing waste water and corro-

sive salts, produced in a coke producing apparatus and normally utilized to quench coke in a coke quenching apparatus, with waste steam from a continuous coke quenching apparatus to produce substantially pure salt free condensate, said apparatus having

a. vaporizing means for vaporizing said waste fluid at a first predetermined temperature at a first predetermined pressure to vaporize a portion of said liquiform waste and to concentrate the corrosive salts to form a concentrate;

b. an indirect heat exchanger for heating said concentrate in heat exchange relationship with either high temperature steam or said waste steam, at a second predetermined temperature at a second predetermined pressure, 1. said second predetermined pressure being greater than said first predetermined pressure;

c. another vaporizing means for vaporizing said concentrate at said second predetermined temperature at said second predetermined pressure to vaporize a second portion of said concentrate and to concentrate the corrosive salts to form a second concentrate;

d. condensing means for condensing said second vaporized portion and said steam to form substantially salt-free condensate; and

e. means for utilizing said substantially salt-free condensate for coke quenching, thereby eliminating the disposal of said liquefom waste and the contamination of the atmosphere with said waste if said waste were employed to quench said coke in said coke quenching apparatus, and utilizing said waste steam for its heat energy.

3,912,579

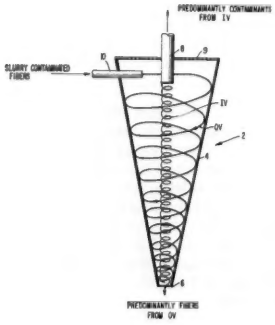
REVERSE CLEANING AND DE-INKING OF PAPER STOCK

Harry J. Braun, Neenah, Wis., assignor to Bergstrom Paper Company, Neenah, Wis.

Continuation-in-part of Ser. No. 830,395, June 4, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 99,850

Int. Cl.[2] B04C *3/06;* **B01D** *3/00*

U.S. Cl. 162—4 **3 Claims**



1. In the recovery of paper fibers for reuse from waste paper material, the process of separating the reusable paper fibers from certain contaminants, a first type of which have specific gravities lower than that of water, and a second type including ink peppers, clays, pigment and fillers, which have specific gravities substantially greater than that of water but which, because of size, shape or size and shape, have a high hydraulic drag coefficient, which comprises;

a. supplying said slurry to a closed cylindricalconical vessel having a tangentially arranged inlet port adjacent the base thereof and having an outlet port in the base thereof and an outlet port in the apex thereof,

b. maintaining the slurry flow through the vessel at a substantially higher rate than that which is normal for the vessel operating in normal fashion at nominal capacity, which normal rate is determined by the equation

$$Q \approx 0.741\ D_c^3$$

where

Q = through flow in gpm

D_c = diameter of cone base in inches

while maintaining in said outlet ports a flow relation wherein the flow through the apical outlet port is at least as great as the flow through the base outlet port to develope centrifugal force conditions causing vortical separation of said slurry with increased concentration of fibers in an outer fraction of the vortex which moves towards the apical outlet thereby increasing in an inner fraction of the vortex which moves towards the base outlet the ratio of the second type of contaminants to fiber above that which prevails with normal through flow and while increasing in said inner fraction the concentration of the first type of contaminants above that which prevails with normal through flow

c. exhausting through the base outlet the contents of the inner fraction consisting essentially of water, said contaminants and a minor portion of said fibers, and

d. exhausting through the apical outlet the contents of the outer fraction consisting essentially of water, the great predominance of said fibers, and a minor portion of said contaminants.

3,912,580

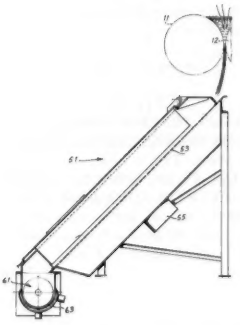
METHOD FOR SOLIDIFYING SMELT

James W. Casten, Mountain Brook, Ala., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Oct. 23, 1973, Ser. No. 408,989

Int. Cl.[2] D21C *11/00*

U.S. Cl. 162—30 **3 Claims**



1. A process for forming sheets of solidified smelt from molten smelt such as the type which is derived from the combustion of black liquor solids in paper pulping processes comprising:

a. admitting a stream of such molten liquid smelt at a temperature above about 1200°F into a reservoir above the nip between a pair of closely spaced drums having a minimum but expandable preset nip clearance of 0.005 to 0.025 inches;

b. rotating the drums into the liquid stream and resiliently urging one of the drums toward the other;

c. concurrently cooling the drums to reduce the localized temperature of the smelt at the nip to its freezing temperature and to remove the heat of fusion of the smelt, and forming a thin, brittle sheet of solidified smelt which issues at a temperature below about 900°F vertically downward from the nip and which is free of the surface of the either drum.

3,912,581
NON-WOVEN WEB STRUCTURES AND METHOD FOR MAKING THE SAME

Herbert Fink, Bickenbach, and Manfred Munzer, Bensheim, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

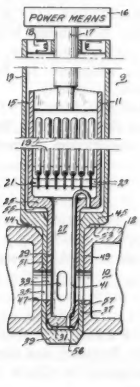
Continuation of Ser. No. 247,686, April 26, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,258
Claims priority, application Germany, May 3, 1971, 2121593
Int. Cl.² D21D *3/00*
U.S. Cl. 162—164 **6 Claims**

1. In a process for the preparation of non-woven fabric by adding particles of a resin binder to an aqueous suspension of fibers, forming a web by depositing said fibers on a sieve, removing water from said web, and drying said web, the improvement wherein said particles of resin binder are added as an aqeous suspension of a suspension polymer in an amount such that the resin solids added are from 10 – 100 percent by weight of the suspended fibers, said suspension polymer particles having an average diameter between about 0.05 mm and 0.5 mm and said polymer having a glass transition temperature below 35°C. and being a homopolymer or copolymer comprising a member selected from the group consisting of acrylic acid esters having 1 – 18 carbon atoms in the alcohol portion thereof, methacrylic acid esters having from 4 – 18 carbon atoms in the alcohol portion thereof, butadiene, vinylidene chloride, vinyl acetate, methyl methacrylate, ethyl methacrylate, methacrylonitrile, acrylonitrile, acrylamide, methacrylamide, and sytrene.

3,912,582
HYDRAULIC BALANCING OF A CONTROL COMPONENT WITHIN A NUCLEAR REACTOR

Danny Marinos, Kennewick, and Hans C. F. Ripfel, West Richland, both of Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 498,147
Int. Cl.² G21C *7/10*
U.S. Cl. 176—36 R **6 Claims**



1. In a reactor-control component having an inner conduit containing neutron-absorber elements, said conduit supported coaxially within but spaced from a guide duct to form passageways for coolant flow, said passageways including an inner passageway through said conduit and an outer passageway through the annular space between said conduit and guide duct, the improvement comprising:

a. a transverse wall interrupting said guide duct at an end portion thereof, said wall having a tubular receptacle extending longitudinally therefrom and an opening for admitting coolant flow;

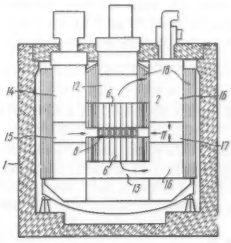
b. a transverse partition partially closing one end of said inner conduit, said partition having a tube piece longitudinally extending therefrom towards and in coaxial alignment with said receptacle and having an opening for admitting coolant flow; and

c. movable support means for longitudinally positioning said inner conduit in respect to said guide duct in inserted positions in which said tube piece is closely received within said receptacle and in withdrawn positions in which said tube piece is separated from said receptacle, said tube piece and receptacle cooperating in said inserted position to restrict the flow of coolant into said outer passageway and thereby minimize forces that tend to expel said component from said inserted position.

3,912,583
FAST-NEUTRON REACTOR

Vladimir Grigorievich Iljunin, ulitsa Migunova, 9, kv. 28, Obninsk, Kaluzhskoi oblasti; Viktor Mikhailovich Murogov, ulitsa Lenina, 13/1, kv. 4, Obninsk Kaluzhskoi oblasti, and Anatoly Nikolaevich Shmelev, ulitsa Novorogozhskaya, 4, kv. 7, U.S.S.R.

Filed Aug. 30, 1973, Ser. No. 393,127
Int. Cl. G21c *1/02, 15/04*
U.S. Cl. 176—40 **36 Claims**



1. A fast-neutron reactor comprising a core; a lateral blanket; an upper and a lower axial blankets enveloping, together with said lateral blanket, said core of the reactor; fuel element stacks disposed in said core and in all said blankets; each of said fuel element stacks having holes disposed in its walls approximately in the middle portion thereof with respect to the height of said core; main fuel elements disposed in said stacks above the plane passing through the center of said holes; additional fuel elements disposed in said stacks below said plane opposite to said main fuel elements; a coolant washing said main and additional fuel elements; an inlet header for said coolant, said inlet being formed by the spacing between said main and additional fuel elements together with said holes and splitting said coolant into two oppositely directed flows; and two outlet headers for said coolant arranged below and above said lower and upper axial blankets, respectively.

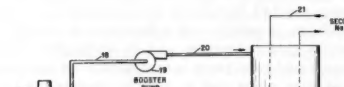
3,912,584
LMFBR WITH BOOSTER PUMP IN PUMPING LOOP

Herbert J. Rubinstein, Los Gatos, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 9, 1974, Ser. No. 432,007
Int. Cl.² G21C *15/24*
U.S. Cl. 176—40 **5 Claims**

1. In a coolant circulation system for a liquid metal fast breeder reactor having a reactor core containing nuclear fuel and positioned in a containment vessel, liquid metal coolant

contained by said vessel and surrounding said core, a cover gas under pressure above the said coolant in said vessel, a heat exchanger means positioned externally of said containment vessel, and means for circulating coolant from said heat exchanger means to said containment vessel and from said containment vessel to said heat exchanger; the improvement



comprising: at least one main coolant pump positioned in the coldleg to supply coolant to said containment vessel from said heat exchanger means, said main coolant pump being located at a high elevation with respect to said core and at least one low head, high capacity, high specific speed booster pump positioned to pump coolant heated by said reactor core from said containment vessel to said heat exchanger means.

3,912,585

PROCESS FOR AEROBIC CULTIVATION OF MICROORGANISM

Tokuji Iijima; Yooji Odawara, and Tetsuo Yamaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 29, 1972, Ser. No. 319,609
Claims priority, application Japan, Dec. 29, 1971, 47-1604
Int. Cl.² C12B *1/00*
U.S. Cl. 195—28 R **7 Claims**

1. A continuous process for the aerobic multi-batch cultivation of a microorganism which assimilates n-paraffins in a cultivating plant comprising a plurality of cultivating batches, each batch being provided with an agitator for agitating an aqueous suspension comprising the microorganism, n-paraffins having 7–20 carbon atoms and water charged thereto, and being connected through controllable valve means to a gas source for supplying an oxygen-containing gas to each of said batches, which comprises the steps of:

establishing an S-shaped curve representing the relationship between a cultivation period required for performing the aerobic cultivation and the necessary amount of oxygen with respect to the microorganism;

subdividing the cultivation period into a plurality of steps including a first cultivation step and a final cultivation step to thereby establish a time schedule for the start and finish of each step of cultivation among the batches;

determining the necessary amount of oxygen at each of the steps in accordance with said S-shaped curve;

supplying successively to each of said batches the oxygen-containing gas at a constant rate and in amount corresponding to the necessary amount of oxygen at each of the steps from said gas source, with agitation at a constant speed throughout the cultivation; and

regulating successively the amount of gas to be supplied to each of the batches by controlling said valve means so as to increase stepwise the rate of gas supplied from the first step to the final step in accordance with the predetermined time schedule, after initiating the supply and regulation of the gas to a first batch, the supply and regulation of the gas being effected simultaneously to at least two of said batches during said process until termination thereof.

3,912,586

METHOD OF PRODUCING DICARBOXYLIC ACIDS BY MICROORGANISMS

Hiroo Kaneyuki, Yamaguchi, and Koichi Ogata, Osaka, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 28, 1973, Ser. No. 345,622
Claims priority, application Japan, June 28, 1972, 47-64061
Int. Cl.² C12D *1/02*
U.S. Cl. 195—28 R **3 Claims**

1. A method for preparing the n-paraffin dicarboxylic acids - pimelic acid, adipic acid and sebacic acid, which comprises culturing the yeast strain *Torulopsis candida* NRRL NO. Y-7506 in a medium containing as essential components carbon sources and nitrogen sources, said carbon sources being mainly composed of at least one n-paraffin with 9 to 16 carbon atoms, at a temperature of 20° to 35°C and at a pH of 2 to 9, to accumulate said n-paraffin dicarboxylic acids.

3,912,587

METHOD OF PRODUCING GUANOSINE BY FERMENTATION

Hitoshi Enei, Zushi; Yasuo Anzai; Katsuaki Sato, both of Kawasaki; Hajime Eguchi, Yokohama, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed June 10, 1974, Ser. No. 478,157
Claims priority, application Japan, June 14, 1973, 48-67276
Int. Cl.² C12D *13/06*
U.S. Cl. 195—28 N **4 Claims**

1. A method for producing guanosine which comprises culturing a guanosine-producing mutant selected from the group of mutants derived from Bacillus subtilis and Bacillus pumilus which requires adenine for growth and which is resistant to at least one compound selected from methionine, methionine analogue and azaserine, under aerobic condition in an aqueous culture medium until guanosine accumulates in the medium, and recovering accumulated guanosine from culture medium.

3,912,588

CREATINE AMIDOHYDROLASE IN THE CONVERSION OF CREATININE TO CREATINE

Hans Mollering; Klaus Beaucamp; Michael Nelboeck-Hochstetter, and Hans Ulrich Bergmeyer, all of Tutzing, Upper Bavaria, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 249,589, May 2, 1972, Pat. No. 3,806,416.
This application Oct. 31, 1973, Ser. No. 411,526
Claims priority, application Germany, May 5, 1971, 2122298
Int. Cl.² C12K *1/00;* **C12D** *13/06*
U.S. Cl. 195—29 **1 Claim**

1. Process for the conversion of creatinine to creatine, which process comprises incubating a creatinine-containing mixture with creatinine amidohydrolase at a pH above 7.

3,912,589

PREPARATION OF CEPHALOSPORIN COMPOUNDS

Alan Smith, Ulverston, England, and Stephen Arthur Goulden, Orinda, Calif., assignors to Glaxo Laboratories Limited, Greenford, England

Filed May 10, 1974, Ser. No. 468,647
Int. Cl.² C12D *13/02*
U.S. Cl. 195—29 **13 Claims**

1. In a process for the enzymically catalysed hydrolysis of a 3-acyloxymethylceph-3-em-4-carboxylic acid to a 3-hydroxymethyl analogue thereof the improvement which consists of contacting said 3-acyloxymethylceph-3-em-4-carboxylic acid with an esterase produced by culturing a yeast microorganism or a mutant thereof of the genus Rhodotorula.

3,912,590

PROCEDURE FOR LIQUEFYING STARCH

Steen Slott, Bagsvaerd, and Gerda Bente Madsen, Lyngby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 3, 1973, Ser. No. 320,724
Int. Cl.² C12D *13/02*
U.S. Cl. 195—31 R **8 Claims**

1. A process for combined liquefaction and thinning of starch which comprises treating an aqueous suspension containing therein in excess of 25% by weight of a starch material and from 0.020.10% by weight of alphaamylase based upon dry starch content and upon an enzymatic activity of 120 K NOVO units per gram of enzyme preparation, the alphaamylase being the alpha-amylase produced by *B. licheniformis*, the treatment being at a temperature in the range of 100°–115°C. for a time period in the range of 1–60 minutes producing thereby a liquefied thinned starch solution of a viscosity less than about 300 c.p.s. measured at 95°C.

3,912,591

PROCESS FOR THE PRODUCTION OF PULLULAN

Koso Kato, and Makoto Shiosaka, both of Okayama, Japan, assignors to Hayashibara Biochemical Laboratories, Incorporated, Okayama, Japan

Filed Aug. 29, 1973, Ser. No. 392,621
Claims priority, application Japan, Sept. 4, 1972, 47-87938
Int. Cl.² C12D *13/04*
U.S. Cl. 195—31 P **6 Claims**

1. A process of producing pullulan which comprises:

a. culturing a pullulan producing microorganism on an aqueous culture medium containing assimilable sources of carbon and nitrogen and minor nutrients necessary to the growth of said microorganism until pullulan accumulates in said medium,

1. the initial pH value of said medium being between 5 and 7.5,

2. said medium having an initial content of phosphate ions corresponding to 0.1 g to 0.4 g K_2HPO_4 per deciliter,

3. said content of phosphate ions being low enough to make the mean molecular weight of pullulan higher than the mean molecular weight of pullulan produced in said medium by said microorganism at a phosphate ion concentration corresponding to 0.5 g K_2HPO_4 per deciliter; and

b. recovering said accumulated pullulan from said medium.

3,912,592

METHOD FOR PRODUCING L-SORBOSONE

Shraga Makover, Verona, and David Louis Pruess, Passaic, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 6, 1974, Ser. No. 467,175
Int. Cl.² C12D *1/00*
U.S. Cl. 195—31 R **6 Claims**

1. A method for producing L-sorbosone from L-sorbose which comprises pre-culturing under submerged aerobic conditions at a temperature of from 20° to 45°C. and a pH of from 5 to 9, a microorganism selected from the group consisting of:

Paecilomyces;
Mycobacterium;
Pseudomonas;
Serratia;
Bacillus;
Aerobacter;
Streptomyces;
Gluconobacter;
Sarcina; and
Acinetobacter,

in an aqueous medium to produce cells containing an enzyme system capable of converting L-sorbose to L-sorbosone, incubating under submerged aerobic conditions at a temperature of from 20° to 45°C. and a pH of from 5 to 9, said cells with a medium containing L-sorbose to convert the L-sorbose to L-sorbosone and recovering L-sorbosone from said media.

3,912,593

WATER-INSOLUBLE NITROGEN-CONTAINING BIOLOGICALLY ACTIVE ORGANIC SUBSTANCES

Sydney Alan Barker; Ian Malcome Kay, and John Frederick Kennedy, all of Birmingham, England, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Sept. 4, 1973, Ser. No. 394,077
Claims priority, application United Kingdom, Sept. 6, 1972, 41436/72
Int. Cl.² C07G *7/02*; C12K *1/00*
U.S. Cl. 195—57 **26 Claims**

1. Water-insoluble metal chelates of biologically active nitrogen-containing organic substances with a hydrous oxide of a metal selected from the group consisting of zirconium, titanium, iron, tin and vanadium which metal chelates of the biologically active nitrogen-containing organic substances contain the biological activity of said nitrogen-containing organic substances.

3,912,594

METHOD OF PRODUCING DEXTRANASE

Kazuo Shimada, Kanonji; Kenichi Kotera, Suita; Takaaki Uemura, Kanonji; Kunio Imamura, Kanonji; Nobuyoshi Ishikawa, Kanonji; Fumiko Hojho, Kanonji, and Kiyoshi Ugawa, Kanonji, all of Japan, assignors to Research Foundation for Microbial Diseases of Osaka University, Japan

Filed Apr. 17, 1973, Ser. No. 351,886
Claims priority, application Japan, Apr. 17, 1972, 47-39048
Int. Cl.² C12D *13/10*
U.S. Cl. 195—65 **5 Claims**

1. A method for the production of dextranase which comprises culturing a dextranase-biosynthesizing microorganism belong to the genus Flavobacterium and capable of producing a potent dextran hydrolyzing enzyme in a culture medium and recovering from said medium the dextranase which accumulates therein.

3,912,595

METHOD OF PURIFYING ENZYMES USING BORONIC ACIDS COVALENTLY BONDED TO AN INSOLUBLE SUPPORT

Manfred H. W. Philipp, Freiburg, Germany; Myron L. Bender, Evanston, Ill., and Pablo V. Valenzuela, Santiago, Chile, assignors to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

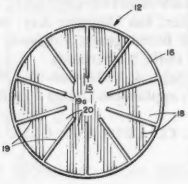
Filed Feb. 25, 1974, Ser. No. 445,665
Int. Cl.² C07G *7/00*
U.S. Cl. 195—66 R **8 Claims**

1. A method for the purification of a soluble serine-hydrolytic enzyme consisting of passing an aqueous solution of the soluble serine-hydrolytic enzyme at pH from 7.0 to 8.5 through a column packed with a granular water-insoluble support to which is covalently bonded a boronic acid group attached by an alkyl or aryl hydrocarbon residue having at least one additional functional group capable of forming a covalent bond with the granular water-insoluble support to reversibly complex said enzyme.

3,912,596
MULTIPLE INOCULATING SYSTEM

Riaz-ul Haque, Glen Ellyn, and Richard A. Murphy, Oak Park, both of Ill., assignors to International Foundation of Microbiology, Chicago, Ill.

Continuation of Ser. No. 233,023, March 9, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,479
Int. Cl.² C12B *1/02*
U.S. Cl. 195—127 **7 Claims**

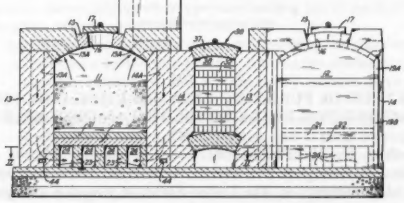


1. A multiple inoculation system comprising, in combination, inoculation means carrying a plurality of inoculating needles, means for contacting said inoculating needles with inoculum, and a culture dish for holding a medium suitable for cultivation by inoculum carried by said needles, said culture dish having a bottom, an upstanding outer wall surrounding its periphery, a plurality of upstanding, inner divider walls extending from the outer wall inwardly toward the center of the dish to thereby define a plurality of dish compartments, and intercommunication openings in the inner divider walls forming means between said compartments whereby a liquid culture medium poured onto the dish readily flows by gravity into and is retained by each of the compartments.

3,912,597
SMOKELESS NON-RECOVERY TYPE COKE OVEN

James E. MacDonald, R.D. 4, Box 93, Latrobe, Pa. 15650, and Oliver K. Painter, 101 N. Church St., Mount Pleasant, Pa. 15666

Filed Mar. 8, 1974, Ser. No. 449,234
Int. Cl. C10b *3/00, 5/00, 9/00*
U.S. Cl. 202—102 **10 Claims**

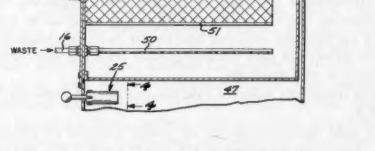


1. A coke producing apparatus comprising,
means for forming an oven chamber including side walls, an oven roof carried by the side walls, removable door means for the discharge of coke from the oven chamber, and a floor to support a coal charge introduced into the oven chamber through a closable opening in said roof,
means defining a sole heating flue including at least one passageway for conducting partially burned distillation products beneath said floor in heat conducting contact therewith,
means for conducting partially burned distillation products from the space above a coal charge in said oven chamber into said sole heating flue,
means defining a discharge flue arranged to receive the partially burned distillation products from said sole heating flue,
ignition chamber means having checkerbricks therein at the delivery side of said discharge flue and remote to said sole heating flue for essentially complete combustion of partially burned distillation products conducted from the space above the coal charge in the oven chamber through said sole heating flue and thence by said discharge flue into the ignition chamber means, and
a stack drawing combustion products from said ignition chamber means for exhaust to the atmosphere.

3,912,598
WASTE MANAGEMENT SYSTEM

H. Douglas Dick, 1951 Port Locksleigh Place, Newport Beach, Calif. 92660

Filed May 23, 1973, Ser. No. 362,963
Int. Cl.² B01D *3/00, 5/00, 35/18;* **A47K** *11/02*
U.S. Cl. 202—185 **3 Claims**



1. A waste management system comprising:
a waste-holding tank
a container for pressurized fuel-gas;
means for pressurizing said waste-holding tank;
said pressurizing means comprising said container and conduit means between said waste-holding tank and said container;
a reaction-chamber having an outer shell comprising means dividing the interior thereof into upper and lower separated chambers;
said reaction-chamber further including a burner-unit in said lower chamber, at least one waste-discharge nozzle in said upper chamber connected to said waste-holding tank and discharging into said reaction-chamber, and catalytic purifying means within said upper chamber immediately above said waste-discharge nozzle having catalytic material to be contacted by the vapor products which result at the waste-discharge nozzle as said burner-unit heats said upper chamber;
conduit means connecting said burner-unit to said container;
conduit means connecting said waste-discharge nozzle to said waste-holding tank;
means for igniting the said fuel-gas at said burner-unit;
flue means for containing and discharging the combustion products resulting from the combustion of said fuel-gas without mingling the combustion products with the vaporization products;
means for condensing said vaporization products to liquid water;
means for further purifying said water by filtration;
a potable water tank; and
conduit means for directing said vaporization products from said catalytic purifying means through said condensing means and filtration means to said potable water tank.

3,912,599
PROCESS FOR THE PURIFICATION OF PIVALOLACTONE

John L. Dawes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,442
Int. Cl.² C07D *305/12*; **B01D** *3/34*
U.S. Cl. 203—61 **8 Claims**

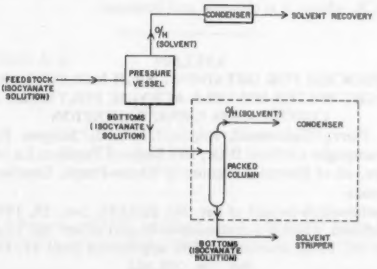
1. A process for separation of pivalolactone from impure mixtures of pivalolactone and isobutyric acid which impure mixtures have a ratio of pivalolactone to isobutyric acid of from about 1.0:99.0 to about 99.0:1.0 whereby

1. the impure mixture is fed into an extractive distillation column at an intermediate point selected so that the composition of the material in the extractive distillation column at the feed point approximates the composition of the impure material fed to the column;
2. introducing at a point near the top of the said extractive distillation column an extraction agent selected from the group consisting of lower aliphatic, straight- or branched-chain, monofunctional carboxylic acids having a carbon backbone of from 3 to 8 carbon atoms and optionally side chains of 1 to 5 carbon atoms which extractive agent has the properties of being inert to the components of the feed stream under the condition of the separation, destroying the isobutyric acid/pivalolactone azeotrope and reducing the vapor pressure of isobutyric acid;
3. operating the said extractive distillation column at a pressure of from about 1 mm to about 100 mm which pressure has been selected so that the temperature of the column at the point wherein the impure mixture is introduced is less than the temperature at which isobutyroxypivalic acid is formed and the temperature at the top of the column is less than the temperature at which polymerization of pivalolactone commences; and
4. recovering from the top of said column a stream enriched in pivalolactone.

3,912,600
RECOVERY OF POLYMETHYLENE POLYPHENYL POLYISOCYANATE FROM A PHOSGENATED POLYAMINE FEED

Richard Hatfield, Jr., Pasadena, and Howard R. Steele, Baytown, both of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 9, 1974, Ser. No. 468,246
Int. Cl.² B01D *3/00*, *3/10*
U.S. Cl. 203—73 **6 Claims**



1. In a process for recovering a polymethylene polyphenyl polyisocyanate from a solution of said polyisocyanate in an organic solvent selected from the group consisting of toluene, xylene, decalin, monochlorobenzene and dichlorozbenzene said solution being the product obtained by phosgenation of the polymethylene polyphenyl polyamine, the improvement which comprises charging said polyisocyanate solution, after purging of phosgene but prior to stripping the bulk of said organic solvent, to a flash vessel and maintaining said solution therein at a pressure in the range of about 20 psia to about 60 psia and at a temperature in the range of about 150°C to about 230°C, said temperature being below the boiling point of said polyisocyanate at the pressure employed, for a time in the range of about 10 to 50 minutes with removal of a portion of the inert organic solvent as volatile overhead.

3,912,601
SURFACE TREATMENT OF TIN-PLATED STEEL SHEETS

Hidejiro Asano, and Yoshitaka Hiromae, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Japan

Filed July 18, 1974, Ser. No. 489,489
Claims priority, application Japan, Aug. 1, 1973, 48-86622
Int. Cl.² C25D *11/36*
U.S. Cl. 204—56 R **2 Claims**

1. A surface treatment of a tin-plated steel sheet which comprises electrolyzing the tin-plated steel sheet as a cathode with a quantity of electricity between 1 and 50 c/dm² in an aqueous solution containing 1 to 50 g/l of at least one of aluminum dihydrogenphosphate, aluminum monohydrogenphosphate and their mixtures, having a pH of 3 or less.

3,912,602
PROCESS FOR COLOURING ALUMINUM ELECTROLYTICALLY

Walter Zweifel, Neuhausen am Rheinfall, and Fritz Schneeberger, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 7, 1974, Ser. No. 521,664
Claims priority, application Switzerland, Nov. 9, 1973, 15799/73
Int. Cl.² C25D *11/22*
U.S. Cl. 204—58 **7 Claims**

1. A process for colouring previously anodically-oxidised articles of aluminum or aluminum alloys by the electrolytic treatment of the aluminum oxide layer with alternating current in an acidic, aqueous electrolyte containing metallic salts for colouring, in which the electrolyte has an addition of an amino-alcohol made to it.

3,912,603
ELECTROLYTIC BATH FOR THE REMOVAL OF METALS

Gerhard Mietens, Hurth-Efferen, and Michael Ahlgrim, Erftstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Cologne, Germany

Filed Dec. 17, 1974, Ser. No. 533,719
Claims priority, application Germany, Dec. 20, 1973, 2363352
Int. Cl.² C25F *5/00*
U.S. Cl. 204—146 **13 Claims**

1. Electrolytic bath for removing metallic coatings, such as nickel, chromium, zinc, tin, copper, cadmium or silver plate, from steel parts, the bath containing, in aqueous solution,

a. at least one substance selected from the group consisting of nitric acid and its salts with inorganic and organic bases;
b. at least one substance selected from the group consisting of organic acids and their salts; and
c. a water-soluble halogen compound, being characterized in that the halogen compound is a soluble iodine compound.

3,912,604
PROCESS FOR BROMINATING METHYLCHLOROSILANES

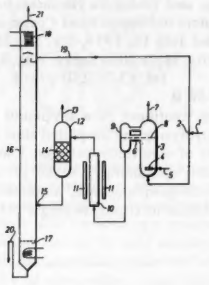
Hans Joachim Lucking, Bergisch-Neukirchen; Klaus Seyfried, Schildgen; Walter Noll, Opladen, and Ludwig Fries, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1974, Ser. No. 489,680

Claims priority, application Germany, July 27, 1973, 2338181

Int. Cl.² B01J 1/10

U.S. Cl. 204—158 HA **3 Claims**



1. In the production of a bromomethylmethylchlorosilane of the formula

$$Br—CH_2—Si(CH_3)_nCl_{3-n}$$

in which n is 1 or 2,

by reacting a methylchlorosilane of the formula

$$(CH_3)_{n+1}\ SiCl_{3-n}$$

with bromine in the liquid phase and under the action of radiation which initiates the photochemical reaction between bromine and the methylchlorosilane, the improvement which comprises mixing the bromine with the methylchlorosilane and with chlorine in a first zone with exclusion of light which would initiate the photochemical reaction, separating any undissolved bromine and chlorine from the solution, thereafter introducing the resulting solution free of undissolved gas into a second zone separate from said first zone, and exposing said solution to radiation to initiate the photochemical reaction in said second zone.

3,912,605
RADIATION CROSSLINKED VINYL CHLORIDE RESIN

Keizi Nishio; Takashi Sasaki; Kunio Araki, all of Takasaki, and Masatoshi Fukushima, Fuchu, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 275,052, July 25, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 515,852

Claims priority, application Japan, July 26, 1971, 46-55220

Int. Cl.² C08F 8/00, 2/46

U.S. Cl. 204—159.14 **6 Claims**

1. A method of crosslinking a vinyl chloride resin having a polymerization degree of from about 200 to about 5,000 and selected from the group consisting of polyvinyl chloride and a vinyl chloride copolymer consisting essentially of at least 50% by weight of vinyl chloride and no more than 50% by weight of at least one copolymerizable monomer having an ethylenically unsaturated double bond in its molecule comprising

incorporating about 0.5 to about 100 parts by weight, per 100 parts by weight of said vinyl chloride resin, of a specific epoxy compound into said vinyl chloride resin and

irradiating the mixture thus obtained with an ionizing radiation at a dose rate of from about 10^3 to 10^9 rad/hour for a total dose of from about 10^3 to about 10^8 rad,

wherein said specific epoxy compound is prepared by epoxidizing a homopolymer or copolymer of butadiene, said copolymer containing at least 50 weight % of butadiene, and reacting the epoxidized homopolymer or copolymer with an organic unsaturated acid having ethylenically unsaturated double bond in a carbon atom adjacent to a carbon atom of the carbonyl group in its molecule thus forming a specific epoxy compound with an epoxy portion and an adduct portion resulting from the addition reaction of the epoxy portion of the compound and said unsaturated organic acid and

further wherein the specific epoxy compound is bonded with said unsaturated organic acid in a ratio of from about 0.1 to about 0.9 mole of acid per mole of epoxy group in said epoxy compound.

3,912,606
PHOTOSENSITIVE COMPOSITIONS CONTAINING BENZOXAZOLE SENSITIZERS

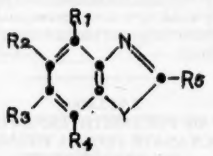
James G. Pacifici, and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1974, Ser. No. 526,012

Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 204—159.15 **14 Claims**

1. A molding and coating composition capable of being hardenable by ultraviolet radiation comprising a mixture of a photopolymerizable or photocrosslinkable ethylenically unsaturated compound and from 0.01 to 10% by weight of a photoinitiator selected from the group consisting of aryl heterocyclic compounds having the formula



wherein R_1, R_2, R_3 and R_4 are hydrogen, alkyl, alkoxy, carboxy, alkoxycarbonyl, chlorine, bromine, nitro, amino and can be the same or different;

Y is an oxygen atom,

R_5 is CH_2X, CHX_2, CX_3, aryl-CH_2X; aryl-CHX_2 and aryl-CX_3 where X is chlorine and bromine.

3,912,607
PROCESS FOR OBTAINING HIGH MOLECULAR WEIGHT WATER-SOLUBLE ACRYLIC POLYMERS AND COPOLYMERS USING RADIATION

Jean Pierre Communal, Nogent-L'Artaud; Jacques Fritz, Champagne au Mont D'Or, and Bernard Papillon, La Mulatiere, all of France, assignors to Rhone-Progil, Courbevoie, France

Continuation-in-part of Ser. No. 220,691, Jan. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 76,603, Sept. 29, 1970, abandoned. This application June 17, 1974, Ser. No. 480,303

Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 204—159.23 **15 Claims**

1. A process for obtaining, in solid state, thermoplastic water-soluble acrylic polymers and copolymers, comprising the steps of:

depositing onto a substrate as a thin layer of at least about 3 mm or in the form of distinct droplets an aqueous solution of at least 60% by weight of acrylic monomer or monomers selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, methacrylonitrile,

acrylic acid, methacrylic acid, and salts and esters of acrylic acid and methacrylic acid, said monomer or monomers being selected such that the resulting polymer or copolymer is water-soluble, said solution having a pH of at least 8 and containing a photopolymerization promoter in a percentage between 0.05 and 10% by weight of monomer;

subjecting said solution to a luminous irradiation having a wave length chosen in the range from 1500 to 5000 angstroms;

simultaneous with said subjecting step, controlling the temperature of the reaction mixture to below 149°C by cooling; and

removing from said substrate the polymers and copolymers formed after irradiation.

3,912,608

PROCESS FOR CURING A RADIATION COMPOSITION COMPRISING AN EPOXY COMPOUND AND AN AMINO ACRYLATE

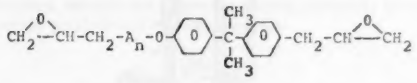
Nelson S. Marans, and Alfred Gluecksmann, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 389,316, Aug. 17, 1973. This application June 19, 1974, Ser. No. 480,648

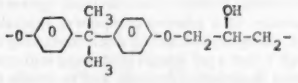
Int. Cl. B01j *1/10, 1/12;* **C08f** *33/08*

U.S. Cl. 204—159.15 **9 Claims**

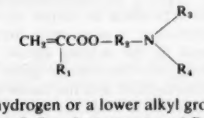
1. A process for polymerizing a radiation curable composition consisting essentially of 40–95 parts of an epoxy compound having the formula



in which A is



and *n* has an average value of 0–13 and 5–60 parts of an ethylenically unsaturated compound having the formula



in which R_1 is hydrogen or a lower alkyl group, R_2 is an alkylene group having 2–8 carbon atoms, and R_3 and R_4 are lower alkyl groups, said process comprising irradiating said composition with 0.01–10 Mrads of high energy ionizing radiation.

3,912,609

METHOD AT ISOTACHOPHORETICAL SEPARATION TO DETECT SPECTROPHOTOMETRICALLY ZONE BOUNDARIES OBTAINED

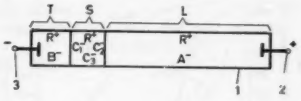
Tord Lennart Arlinger, Ekero, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Jan. 14, 1974, Ser. No. 432,836

Claims priority, application Sweden, Jan. 15, 1973, 7300492

Int. Cl.² B01K *5/00*

U.S. Cl. 204—180 R **2 Claims**



1. In a method of spectrophotometrical detection using an isotachophoretic column containing a leading and a terminating electrolyte with two electrodes spaced from each other along the length of the column electrically charged at opposite polarities, wherein the ions of higher mobility migrate toward one of said electrodes and the ions of lower mobility migrate toward the other of said electrodes, the improvement which comprises the step of adding to the column an electrolyte containing counter-ions whose molar absorptivities within the spectral range employed differ in accordance with the pH values.

3,912,610

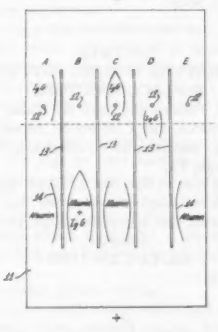
METHOD FOR ELECTROQUANTITATIVE DETERMINATION OF PROTEINS

Kingdon Lou, Tustin, Calif., assignor to ICL/Scientific, Fountain Valley, Calif.

Filed July 23, 1974, Ser. No. 491,069

Int. Cl.² B01K *5/00*

U.S. Cl. 204—180 G **23 Claims**



1. A method for the electroquantitative determination of proteins which are normally only slightly anodically electromobile comprising the steps of:

forming a reactive mixture of said protein, an anodic electromobile protein and an effective amount of a bifunctional linking agent;

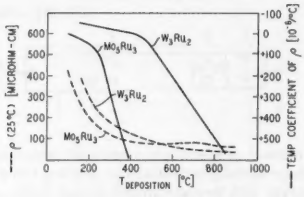
holding said mixture for sufficient period to form the reaction product of said protein, said linking agent and said electromobile protein;

transferring said reaction product to a container provided with a conductive matrix through which an electric current is caused to flow, whereby said reaction product is electrophoretically moved in said matrix, said reaction product having the electromobility substantially that of the electromobile protein.

3,912,611
FILM MATERIAL AND DEVICES USING SAME

William Anthony Royer, North Plainfield; Louis Richard Testardi, Warren, and Jack Harry Wernick, Madison, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1973, Ser. No. 339,768
Int. Cl.[2] C23C 5/00; B44C 1/18
U.S. Cl. 204—192 13 Claims



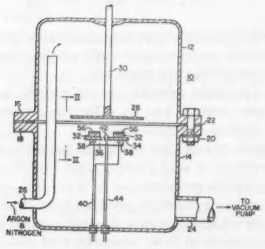
1. Article including a substrate supporting a film having a thickness of from 300 Angstrom units to 10 micrometers, and characterized in that the composition of the film consists essentially of material of a stoichiometry selected from the group consisting of compositions represented by the formulae $Mo_{4\ to\ 6}Ru_3$ and $W_{2.4\ to\ 3.6}Ru_2$, in which the subscripts in the said formulae represent relative numbers of atoms, and which film is deposited by evaporation or sputtering at a temperature of from 400°C to 1,000°C.

12. Process for fabricating a body of a composition selected from the group consisting of compositions represented by the formulae $Mo_{4\ to\ 6}Ru_3$ and $W_{2.4\ to\ 3.6}Ru_2$, in which the subscripts in the said formulae represent relative numbers of atoms, characterized in that the said body is prepared as a sputtered film by sputtering on a substrate with the said film maintained at a temperature of from 400°C to 1,000°C during sputtering and in which sputtering is carried out from a target, the exposed surface of which is of a composition essentially identical to that of the said body.

3,912,612
METHOD FOR MAKING THIN FILM SUPERCONDUCTORS

John R. Gavaler, Pittsburgh; John K. Hulm, Squirrel Hill; Michael A. Janocko, and Clifford K. Jones, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 271,884, July 14, 1972, abandoned, which is a continuation of Ser. No. 802,427, Feb. 26, 1969, abandoned. This application Sept. 19, 1973, Ser. No. 398,902
Int. Cl. C23c 15/00
U.S. Cl. 204—192 9 Claims

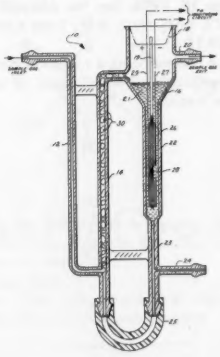


1. A method for reproducibly depositing on a substrate superconductive thin films of transitional metal compounds comprising the steps of placing within a hermetically sealed container at least one transitional metal selected from the group consisting of niobium, titanium, and zirconium, in a position proximate to the substrate, evacuating the container to a pressure of about 5×10^{-10} Torr and heating for a period of time to decontaminate the metal source and the substrate, introducing at least one reactive gas selected from the group consisting of nitrogen and hydrocarbon gases into the container to a pressure of about 5×10^{-5} to 10^{-4} Torr, also introducing into the container a sufficient amount of an inert gas to produce a total pressure of about 10^{-1} to 10^{-2} Torr whereby sputtering of the transition metal source can occur, applying a voltage of between about 1000 to about 3000 volts to the transitional metal source as a cathode, and a current of about 0.8 to about 1 milliampere per square centimeter of cathode surface and heating the substrate to a temperature of about 500°C ± 25°C whereby the transitional metal is sputtered from the source, combines with the reactive gas to form the desired superconducting compound which is deposited as a thin film on the substrate.

3,912,613
TWO-ELECTRODE GAS ANALYSIS SYSTEM FOR ELECTRICALLY SENSING AND CONTROLLING REDOX REACTIONS

Rudolph L. Heuser, 1300 Fair Way, Space 23, Calistoga, Calif. 94515

Filed Sept. 17, 1973, Ser. No. 398,006
Int. Cl.[2] G01N 27/46, 27/44
U.S. Cl. 204—195 R 12 Claims



1. An externally-powered, two-electrode system for measuring the amount of a gaseous component reactable with an electrolyte, the system including a cell containing the electrolyte through which a gas stream containing said component to be measured is passed, a cathode and an anode disposed in spaced apart relation within the electrolyte in the cell, and an externally-powered electrical monitoring circuit connected to the cathode and the anode and in which sensing and generating functions of the circuit are alternately shared only by said cathode and anode, the monitoring circuit including a sensing circuit adapted to apply a first voltage pulse between the cathode and anode to produce an output related to the conductivity of the electrolyte, a generating circuit response to the output produced by the sensing circuit for producing, immediately following said first voltage pulse, a second voltage pulse between the cathode and the anode either sufficient to electrolyze the electrolyte when the sensed conductivity of the electrolyte is within a first range, or insufficient so the electrolyte is not electrolyzed when the sensed conductivity of the electrolyte is within a second range, and means for record-

ing the generating circuit current as an indication of the amount of said gaseous component.

3,912,614
SENSOR

Stanford B. Spracklen, San Juan, and Hideo Watanabe Capistiano, Fullerton, both of Calif., assignors to International Biophysics Corporation, Irvine, Calif.

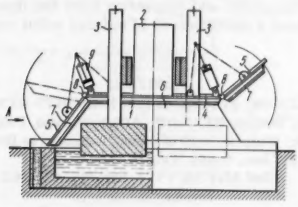
Continuation of Ser. No. 216,445, Jan. 10, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,164
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 B **16 Claims**

1. In an electrode assembly which includes an electrode, supporting structure for the electrode and a selectively permeable membrane covering the electrode to prevent direct contact of fluid to be tested with the electrode and permit selected constituents of the fluid to migrate through the membrane for electrochemical reaction of the electrode, the improvement wherein the membrane consists essentially of hydrophilic polyhydroxyl ethyl methacrylate.

3,912,615
COVERING FOR AN ALUMINIUM CELL WITH BURNT ANODES

Alexei Andreevich Minchenko, ulitsa Turistov, 16, Volgograd, U.S.S.R.

Filed June 20, 1973, Ser. No. 371,697
Int. Cl.² C25C 3/10
U.S. Cl. 204—243 R **1 Claim**

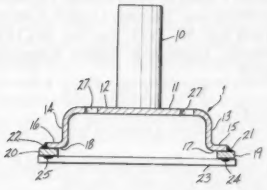


1. An aluminum electrolytic cell comprising: a set of horizontal lids or covers arranged along the longitudinal axis of said cell and connected to the cell framework by hinges; two swivel frames, each of said frames being located on one side of said cell and connected to the framework by hinges at the end portions whose swivel axis is located on the outside of the bars of the burnt anodes; and a set of inclined lids or covers arranged on both sides of the cell along the longitudinal axis of the cell, one end of each of said lids resting on one of said horizontal lids and the other end resting on one of said swivel frames; a drive for said swivel frames to turn; and end walls mounted on said cell framework.

3,912,616
METAL ANODE ASSEMBLY

James M. Ford, Cleveland, Ohio, assignor to Olin Corporation, New Haven, Conn.

Filed May 31, 1973, Ser. No. 365,788
Int. Cl. B01k 3/04
U.S. Cl. 204—286 **12 Claims**



1. In a metal anode assembly for use in a mercury cell having a distributor in the form of an inverted channel, said distributor being comprised of

a. a web having a top, a bottom and two opposite sides,
b. at least one anode post secured to said top of said web,
c. said web having a leg extending downwardly from each of said two opposite sides,
d. a foraminous anodic surface in electric contact with each of said legs,

whereby current is passed through said anode post across said web through said legs to said foraminous anodic surface, through a salt brine and liquid metal cathode below said foraminous anodic surface, to effect the generation of chlorine gas on said foraminous anodic surface,

the improvement which comprises a bandolier secured in electric contact with said legs, said bandolier being comprised of

1. said foraminous anodic surface
2. two continuous metal strips positioned substantially parallel to each other secured to said foraminous anodic surface on the same side thereof, one of said metal strips being secured to each of two opposite ends of said foraminous anodic surface, and
3. the top of one of said metal strips extending continuously throughout the length of one of said legs and being secured thereto, and the top of the other said metal strip extending continuously throughout the length of the other said leg and being secured thereto on the opposite end of said web, the means for securing said metal strips to said legs being accessible from the exterior of said strips and legs.

whereby simple separation of the foraminous anodic surface from said distributor can be obtained to facilitate recoating of said foraminous anodic surface, and reinstallation of the resulting recoated foraminous anodic surface is simplified.

3,912,617

BLENDED REFRIGERATION OIL COMPOSITION

Ivor W. Mills, Media, and John J. Melchiore, Wallingford, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Feb. 14, 1974, Ser. No. 442,552
Int. Cl. C10g *41/00*
U.S. Cl. 208—14 8 Claims

1. A composition, useful as a refrigeration oil containing no more than 10 ppm basic nitrogen, comprising a blend of from 50–75 volume percent of a hydrorefined naphthenic oil component and from 50–25% of a hydrogenated C_{16}—C_{40} polybutene oil, said blend containing in the range of 15–35 weight % aromatic hydrocarbons and having an SUS viscosity at 100°F. in the range of 125–300 SUS and a natural floc point no higher than −35°F. in CCl_2F_2 refrigerant.

3,912,618

OIL TREATMENT PROCESS

Stanley Raymond Collins Dryer, Feltham, England, assignor to The British Petroleum Company Limited, London, England

Filed July 30, 1973, Ser. No. 384,117
Claims priority, application United Kingdom, Aug. 30, 1972, 40198/72
Int. Cl. C10g *31/14*
U.S. Cl. 208—87 19 Claims

1. A method of treating a mineral lubricating oil feedstock, which comprises

contacting the mineral oil feed-stock counter-currently with furfural in a first extraction column,

recovering from the first column a primary raffinate and a primary extract,

removing the furfural from the primary extract,

contacting the primary extract counter-currently with more furfural in a second extraction column,

recovering from the second column a pseudo-raffinate and a secondary extract,

removing the furfural from the pseudo-raffinate,

treating the pseudo-raffinate with a solvent for wax to remove at least part of the wax, and then

catalytically hydrogenating the treated pseudo-raffinate.

3,912,619

PREPARATION OF CRACKING CATALYST

John Storey Magee, Jr., Cooksville, and Raymond Preston Daugherty, Jr., Simpsonville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 282,369, Aug. 21, 1972, abandoned. This application May 2, 1974, Ser. No. 466,441
Int. Cl.² B01J *29/12*; C10G *11/04*
U.S. Cl. 208—120 5 Claims

1. A process for converting hydrocarbons which comprises contacting the same under catalytic cracking conditions with a hydrogel catalyst having a pore size distribution wherein the majority of the pores have a diameter of about 45 to 125 A units prepared by:

a. combining an aqueous solution of sodium silicate with aluminum sulfate, said aluminum sulfate being combined in amounts sufficient to react with about 30 to 90% of said sodium silicate;

b. aging the mixture obtained by way of step (*a*) at a pH of about 9.5 to 11.0 and at a temperature of 50°–140°F. for a period of about 2 to 180 minutes;

c. adding sodium aluminate or aluminum sulfate to said aged reaction mixture obtained by way of step (*b*) to impart the desired alumina content to the hydrogel and aging for about 5 to 60 minutes,

d. recovering and washing said hydrogel, and,

e. reslurrying the washed hydrogel with water and spray drying at a temperature of about 150° to 400°F. to form particles suitable for introduction into a fluid catalytic conversion zone.

3,912,620

LUBRICATING OIL PRODUCTION UTILIZING HYDROGEN IN TWO CATALYTIC STAGES

James P. Gallagher, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 5,963, Jan. 26, 1970, abandoned. This application Mar. 20, 1974, Ser. No. 452,887
Int. Cl.² C10G *23/04*, *23/02*
U.S. Cl. 208—210 11 Claims

1. In a process for producing a hydrocarbon lubricating oil of increased viscosity index and reduced aromatic hydrocarbon content from a raw, mineral lubricating oil feedstock containing at least about 0.3% by weight of sulfur and at least about 1000 ppm. by weight of nitrogen derived from a waxy mineral crude oil, the improvement which comprises first contacting said feedstock with hydrogen and with a sulfur-resistant hydrogenation catalyst at a temperature of about 600°F. to about 800°F. to form a first effluent oil and second contacting said first effluent oil with hydrogen and with a second catalyst at a temperature of about 500°F. to about 800°F., to produce a a second effluent oil, recovering said hydrocarbon lubricating oil having an increased viscosity index and reduced aromatic hydrocarbon content relative to said feedstock from said second effluent oil, said second catalyst comprising a major amount of a faujasite in which at least 50 % of the cations are selected from the group consisting of hydrogen ion, rare earth ion and mixtures thereof, said faujasite having a silica-to-alumina mole ratio of greater than about 3:1, a minor catalytically-effective amount of at least one platinum group metal and a minor amount of at least one refractory inorganic oxide effective to improve the mechanical strength of said second catalyst, said first and second contacting producing less than about 20% by weight of hydrocarbon material boiling below 400°F. based upon the weight of said feedstock.

3,912,621

HYDRO DESULFURIZATION OF HEAVY PETROLEUM OIL AT HIGHER TEMPERATURES AND SPACE VELOCITIES

Stanley Kravitz, Fishkill, and Jitendra A. Patel, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,631
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 6 Claims

1. A method for effecting at least about 90% desulfurization of a petroleum oil having an initial boiling point of at least about 625°F. with a hydrogen consumption of between 220 and 350 scfb which comprises contacting said oil in the presence of added hydrogen with a catalyst comprising an iron group metal, oxide or sulfide thereof and a Group VI-B metal, oxide or sulfide thereof on alumina containing 2–15 wt. % silica at a temperature between 750° and 850°F. a pressure between about 500 and 800 psig and a space velocity between about 3–10 v/v/hr. and recovering from the desulfurization zone effluent a petroleum oil of reduced sulfur content.

3,912,622

SCREENING MACHINE WITH LIGHTS REMOVAL

Joseph A. Bolton, III, North Attleboro, and Peter Edmund LeBlanc, Walpole, both of Mass., assignors to Bird Machine Company, Inc., South Walpole, Mass.

Filed May 30, 1974, Ser. No. 474,362
Int. Cl.² B07B *1/20*
U.S. Cl. 209—17 10 Claims

1. A screening machine for separating solid particles in liquid slurry containing the same and for separating such particles of low density therefrom which comprises:

a tubular screen;

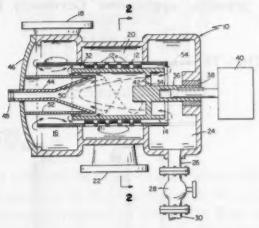
a rotor mounted within the screen coaxially thereof having a substantially closed surface opposite the inner screen surface and rotatable about the screen axis to define with

said screen surface a slurry screening zone having an inlet and an outlet;

an accepts compartment opposite the outer surface of said screen;

a slurry inlet for supplying slurry to be screened to said screening zone inlet;

pumping means for causing slurry to be recirculated by the rotation of said rotor from the outlet to the inlet of said screening zone through the interior of said rotor as a vortex flowing about the axis of the rotor toward the inlet to said screening zone, comprising a rotor inlet for admitting slurry into said rotor adjacent said screening zone outlet and a rotor outlet for discharging slurry from said rotor adjacent said screening zone inlet, and



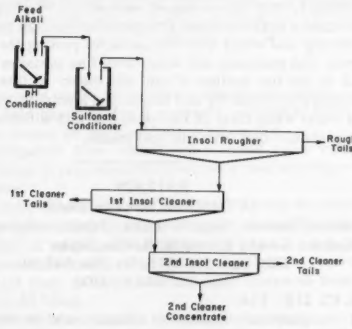
separating means for removing from said machine an inner portion of a said vortex having concentrated therein said low density particles, comprising slurry discharge means having an inlet end positioned in said rotor in spaced relation to the rotor ends and inner wall such as to intercept and discharge through said discharge means said inner portion of a said vortex while leaving the remainder free to flow to said rotor outlet.

3,912,623

FLOTATION RECOVERY OF MOLYBDENUM

Thomas Brian Buza, and Martin Clifford Kuhn, both of Tucson, Ariz., assignors to The Anaconda Company, New York, N.Y.

Filed Aug. 17, 1973, Ser. No. 389,146
Int. Cl.² B13D *1/06*
U.S. Cl. 209—167 **11 Claims**



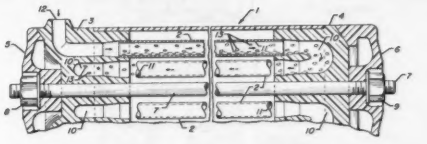
1. A process for separation and recovery of molybdenite values from a copper sulfide mineral concentrate containing molybdenite, comprising conditioning an aqueous pulp of said concentrate with sufficient alkali to render the pulp alkaline, treating the pulp with a sufficient amount of a lignin sulfonate to depress the majority of molybdenite values and subjecting the thus treated lignin sulfonate-pulp mixture to froth flotation to produce a concentrate containing substantially all of the copper sulfide minerals and a tailing containing a high concentration of molybdenite.

3,912,624

CLEANING OF MEMBRANE SURFACES

James L. Jennings, Poway, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 26, 1974, Ser. No. 454,883
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 **5 Claims**



1. An improved rapid method for cleaning the membrane surfaces of a plurality of membrane separation units after being in use, said units having fluid passageways therebetween, which method comprises the steps of: partially filling said fluid passageways, with water, periodically purging said passageways with a continuous air stream at superatmospheric pressure to cause a non-plug flow of water droplets to move at high speed over the membranes of said separation units to thereby remove accumulated materials, prior to each step of partially filling of said passageways with water conducting an osmotic back-flushing through said membrane surfaces whereby to effectuate an initial dislodging of materials from said membrane surfaces, and intermittently repeating said purging step to thereby effect substantial removal of all accumulated materials and all water droplets from said membrane surfaces without permitting drying of said membranes during any stage.

3,912,625

METHOD FOR REMOVING AND DECOLORIZING AQUEOUS WASTE EFFLUENTS CONTAINING DISSOLVED OR DISPERSED ORGANIC MATTER

Forrest N. Case, Oak Ridge, and Eugene E. Ketchen, Kingston, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 240,805, April 4, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,850
Int. Cl.² B01D *15/06*
U.S. Cl. 210—30 **3 Claims**

1. A method for treating chromophoric organic waste material dissolved or dispersed in an aqueous effluent which comprises pressurizing the effluent with oxygen at a pressure in the range 50–2000 psi, contacting the pressurized effluent with an inert particulate carbonaceous sorbent selected from the group consisting of finely divided wood product activated charcoal, bone activated charcoal, and coal and coke derived activated carbon, irradiating the resultant mixture with high energy radiation until a decolorized liquid is produced, and then separating the decolorized liquid.

2. The method according to claim 1 wherein the radiation is gamma radiation.

3,912,626

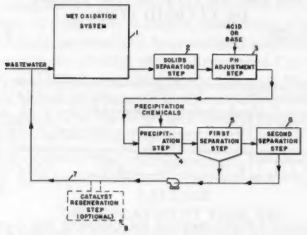
CATALYZED PROCESS AND CATALYST RECOVERY

Robert B. Ely, Wausau; Edmunds M. Pogainis, Mosinee, and Clarence A. Hoffman, Rothschild, all of Wis., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 451,868
Int. Cl.² C02B *1/34*
U.S. Cl. 210—50 **4 Claims**

1. The improvement in the process of wet oxidation of waste-waters which comprises carrying out said oxidation in a

reactor at a temperature between about 150° and 340°C. and a pressure between about 200 and 4000 psi in the presence of cupric ion or silver ion in a concentration of between 10 and 10,000 milligrams per liter, subjecting the resulting oxidized waste-water to liquid-solid separation to remove non-catalytic suspended solids, treating the liquid phase with a source of



sulfide ions which reacts with the cupric or silver ion to form an insoluble precipitate containing cupric or silver sulfide, separating the precipitate from the liquid phase, and reintroducing the precipitate into the wet oxidation reactor thereby regenerating cupric or silver ions for catalysis of the oxidation of additional waste-water.

3,912,627

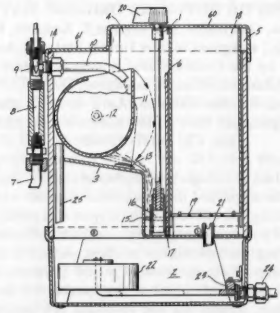
DISSOLVING AND DISPENSING WATER SOLUBLE MATERIAL CONTAINING AVAILABLE CHLORINE TO A SWIMMING POOL

Joseph J. Tepas, Jr., Easton, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 285,714, Sept. 1, 1972, abandoned. This application June 11, 1973, Ser. No. 368,900

Int. Cl. B01d *11/02*; **C01b** *3/06*

U.S. Cl. 210—60 **7 Claims**



1. A method of dissolving and dispensing a water soluble material containing available chlorine to a swimming pool having a recirculation system including means for continuously recirculating water from said pool while maintaining the average concentration of said available chlorine in said pool from about 0.5 to about 1.5 parts per million which comprises:

a. accumulating a body of water from said recirculating water in a rotary receptacle,

b. discharging periodically said body of water to a dissolving zone by rotating said receptacle,

c. contacting said body of water in said dissolving zone with said water soluble solid material containing available chlorine to form an aqueous solution containing available chlorine, and

d. non-continuously dispensing said aqueous solution to treat a portion of said recirculated water such that said available chlorine concentration of said treated portion is at least about 3.5 parts per million, where the time required for dispensing said aqueous solution is from about 10 to about 90 percent of the time required for said accumulating and said discharging said body of water.

3,912,628

METHOD OF AND APPARATUS FOR PROCESSING SLAG, ESPECIALLY FURNACE SLAG

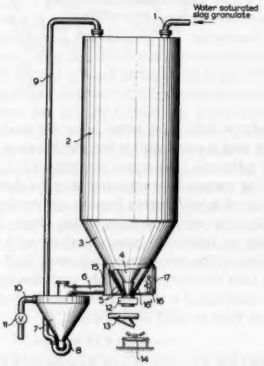
Heinz Büscher, Dortmund-Hochsten, Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Dec. 11, 1973, Ser. No. 423,807

Claims priority, application Germany, Dec. 13, 1972, 2260924

Int. Cl.² B01D *37/02*

U.S. Cl. 210—75 **3 Claims**



1. A method of processing slag from a furnace, which includes the steps of: granulating by water the slag to be processed so as to obtain a mixture of slag granulate composed of fine and coarse particles, and water, introducing the slag granulate and water mixture into a fluid container silo means at the top portion of the silo means, screening the mixture by a perforate wall forming a screen at the bottom of said silo means to form a bed of slag on said screen while passing the water and a portion of said fine particles through said screen, collecting said water with fine particles passing through said screen, and pumping said water with fine particles collected back to the top portion of said silo means to filter the fine particles from water by said bed of slag granulate, drawing off said water when clear of fine particles, and withdrawing said slag granulate bed from said silo means.

3,912,629

AUTOMATIC DRAIN TRAP

Yoshiteru Sonoda, Higashi-Osaka, Japan, assignor to Fuji Kinzoku Kosaku Kabushiki Kaisha, Japan

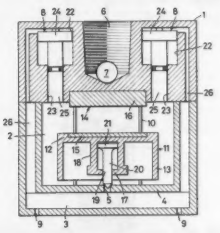
Filed Jan. 30, 1975, Ser. No. 545,306

Int. Cl.² B01D *53/00*

U.S. Cl. 210—114 **1 Claim**

1. An automatic drain trap characterized in that it comprises a primary drain reservoir communicably connected by a drain discharge port to a secondary drain reservoir equipped with drain release holes; a float built in the primary drain reservoir so as to be elevatable in said reservoir by its buoyancy as the drain is accumulated therein; a magnetic device located on the upper surface of the float and the corresponding surface of the upper part of the primary drain reservoir respectively, the magnetic device being adapted to further elevate with momentum the float already elevated to a prede-

termined position; a valve member elevatably sustained in the float so as ordinarily to close the drain discharge port, the valve member opening the discharge port by being pulled upwardly by the float when said float is rapidly elevated with



momentum; and cylinder devices located above the float and actuated by the pressure in the secondary drain reservoir, the cylinder devices being adapted to lower the float by severing it from the magnetic device so as to close the drain discharge port.

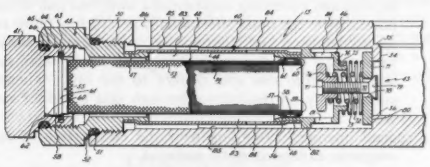
3,912,630
FILTER CARTRIDGE FOR THERMOPLASTIC APPLICATOR SYSTEM

Alan B. Reighard, Bay Village, and Simon Z. Tamny, Lorain, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 299,838, Oct. 24, 1972, Pat. No. 3,815,788. This application Oct. 25, 1973, Ser. No. 409,405. The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.

Int. Cl.² B01D *27/10*

U.S. Cl. 210—130 **20 Claims**



1. For use in combination with a dispensing system,

a manifold block having a generally cylindrical bore, said bore having an internally threaded section,

a combination filter, check valve, relief valve cartridge mounted in said manifold block bore, said cartridge comprising:

a generally cylindrical body, said body having an externally threaded section threaded into the internally threaded section of said manifold block,

A combination check valve-pressure relief valve mounted to said body so as to be removable therewith from the manifold block,

a removable filter retainer mounted in said body,

a replaceable filter attached to said filter retainer, said filter including a filtering screen,

said filter retainer and filter being separately removable from said body while said combination check valve-relief valve is retained in said body, and

means defining a flow path through said cartridge from said check valve, into the interior of said filter, through said filter screen to the exterior of said filter and from the exterior of said filter to the exterior of said cartridge.

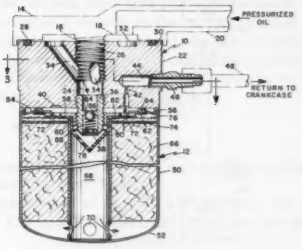
3,912,631
OIL FILTER AND ADAPTER

William C. Turman, 1455 N. Magnolia, El Cajon, Calif. 92020

Division of Ser. No. 261,489, June 9, 1972, Pat. No. 3,802,564. This application Apr. 8, 1974, Ser. No. 459,115

Int. Cl.² B01D *35/14*

U.S. Cl. 210—136 **3 Claims**



1. An oil filter for being attached to an oil filter adapter which adapter has a central bore with a threaded plug for passing oil to the filter and a radially displaced oil receiving port for receiving oil from the filter, the filter comprising,

a cylindrical canister with a closed lower end and a top cap fixed in the upper end,

a mounting plate positioned in the center of the top cap having a nut portion for engaging the plug of the adapter, said top cap having a ring gasket for engaging the adapter and enclosing and sealing the space between the top cap and the adapter including the oil receiving port of the adapter,

said nut portion of said mounting plate extending into the canister below the top cap with a cylindrical projection, a tubular cylindrical core having an upper end fitting around the nut projection and a lower end seated against the closed lower end of said canister,

a cylindrical filter element for being positioned in said filter around said core and spaced from said lower closed end of said canister,

a slit diaphragm valve of flexible material mounted in the upper end of said core for passing oil from the adapter plug to the core and preventing reverse oil flow,

said valve having a cylindrical body that fits around said nut projection between the nut projection and the upper end of said core for sealing the upper end of the core,

the lower end of said core having openings for passing oil to the lower end of said filter element,

and said mounting plate having openings for passing oil from the filter element to the adapter receiving port.

3,912,632
FILTER DEVICE

John P. Winzen, Palos Verdes Estates, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 28,307, April 14, 1970, abandoned. This application May 10, 1972, Ser. No. 252,103

Int. Cl. B01d *29/02*

U.S. Cl. 210—137 **4 Claims**

1. A filter device comprising:

a strip filter medium having a perforated edge thereon;

a take-up spool for holding used strip filter medium;

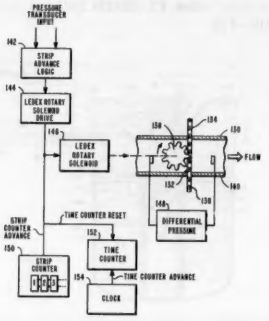
a pressure sensing electrical bridge disposed to measure differential pressure across the strip filter medium;

a logic circuit for reading the differential pressure;

drive menas directly connected to the perforated edge of the strip filter medium for moving said medium from said supply spool to said take-up spool; and,

means interconnecting said logic circuit to said drive means for energizing said drive means for automatically moving

the medium when the differential pressure read by said logic circuit is above a predetermined level and means for



de-energizing said drive means when the differential pressure read by said logic circuit is reduced to below the predetermined level.

3,912,633

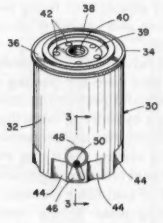
OIL FILTER WITH PULL TAB DRAIN

Arthur Delaney, 521 W. 73rd St., Downers Grove, Ill. 60515

Filed Sept. 9, 1974, Ser. No. 504,524

Int. Cl.² F01M *11/04*

U.S. Cl. 210—168 **6 Claims**



1. In combination with an engine having an oil pump and passages through the engine for the circulation of lubricating oil therethrough, inlet and outlet passage means for the introduction and removal of the lubricating oil from said engine, a filter housing having walls and mounting means for attaching said filter housing to the engine, said housing also having inlet and outlet means thereinto in fluid communication with said engine mounted inlet and outlet passage means, filter media within said housing located between said inlet and said outlet means of said housing, drainage means in one of said walls of said housing constructed and arranged for the drainage of oil therefrom, the improvement comprising said drainage means having a scored portion in one wall of said housing, said scored portion providing a weakened tear strip area capable of being broken to form a drainage opening through said one wall of said housing, tab means including means connected to said weakened tear strip area for separating said area from the housing along said scored portion whereby oil may be drained from said housing.

3,912,634

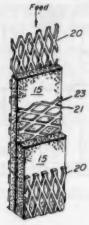
FILTER CARTRIDGE FOR A MAGNETIC SEPARATOR

William F. Howell, Erie, Pa., assignor to Eriez Manufacturing Company, Erie, Pa.

Filed May 1, 1974, Ser. No. 465,906

Int. Cl.² B01D *35/06*

U.S. Cl. 210—222 **3 Claims**



1. A magnetic separator comprising a flow channel member made up of a non-magnetic material,

spaced magnetic members supported on opposite sides of said flow channel providing a magnetic field through said flow channel,

means supporting said flow channel between said magnetic members,

a filter element in said flow channel comprising a container rectangular in cross section and open at its ends and made of non-magnetic material,

filter media in said element,

said filter media comprising a plurality of spaced layers of steel wool and alternate layers of magnetic expanded metal material,

said layers of expanded metal material having a width substantially equal to the inside width of said container,

said magnetic expanded metal material being disposed in planes generally parallel to said container sides and extending from one end of said container to the other,

said layers of steel wool being generally rectangular in cross section and extending substantially from one end of said container to the other substantially completely filling the spaces between said magnetic expanded metal material, providing a fluid flow path through said steel wool substantially from one end thereof to the other whereby substantially all fluid flows through said layers of steel wool,

spaced openings extending over the entire area of said magnetic expanded metal material,

said openings being bounded by sharp edges, whereby magnetic flux is concentrated in symmetrical patterns throughout said steel wool.

3,912,635

DEVICE FOR RECOVERING POLLUTING PRODUCTS SPREAD OVER THE WATER SURFACE, IN PARTICULAR OIL PRODUCTS

Paul Degobert; Francois Kermarrec, both of Rueil-Malmaison, and Yvon Nadaud, Saint-Ouen, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Aug. 24, 1973, Ser. No. 391,520

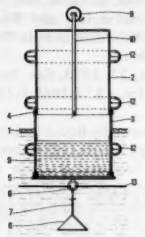
Claims priority, application France, Sept. 18, 1972, 72.33068

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 **14 Claims**

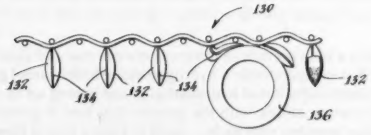
1. A device for recovering polluting liquid spread upon the surface of a body of water, said device comprising a floatable container with one end spaced from another end, a side wall arranged between said ends, said side wall being constructed of an impervious material adjacent to said one end and constructed of a porous hydrophobic material which is easily

wettable by the polluting liquid adjacent to said other end, and means for transferring polluting liquid which has passed into said container through the porous material of said side wall to



an end portion of the container adjacent said one end whereby said container is inverted to allow polluting liquid at said other end to flow to said one end.

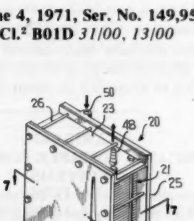
3,912,636
FLUID TREATMENT APPARATUS
Eskil L. Karlson, 43 Westover Lane, Stamford, Conn. 06904
Filed Mar. 4, 1974, Ser. No. 448,019
Int. Cl.[2] B01D *33/16*
U.S. Cl. 210—264 **7 Claims**



1. For use in apparatus for separating and removing selected materials from fluids traveling along a flow path.

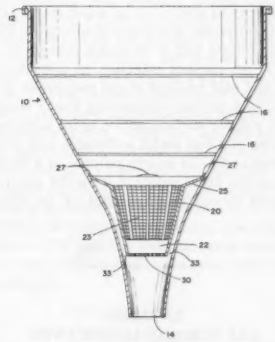
separation means in the form of an endless foraminous belt including elongated bag-like containers adapted for containing ion exchange materials, said containers being made of fluid permeable material constructed and arranged on the surface of said belt along the peripheral length thereof.

3,912,637
EXCHANGE DEVICE
William G. Esmond, 537 Stamford Road, Baltimore, Md. 21229
Filed June 4, 1971, Ser. No. 149,952
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—321 **11 Claims**



1. An exchange assembly comprising a plurality of generally flat flow plates arranged in stacked relation, a membrane sleeve telescoped over each flow plate, each flow plate having formed on opposite surfaces thereof flow path defining means, a housing clamping said stacked flow plates and sleeves together generally in fluid tight relation, said housing including first circulating means for circulating a first fluid between said flow plates and said sleeves at a first pressure and in a direction defined by said flow path defining means and second circulating means for circulating a second fluid at a second and higher pressure between adjacent ones of said sleeves with said second pressure partially deforming said sleeves into said flow paths and defining other flow paths, said other flow paths being formed in said sleeves at the surface thereof remote from the respective flow plate solely by the deformation of said sleeves against said flow plates and being generally parallel to the direction of said first flow path defining means.

3,912,638
SCREEN FUNNEL
Everett E. Beaubien, Lake Elmo, Minn., assignor to Twin Tool, Incorporated, St. Paul, Minn.
Continuation-in-part of Ser. No. 443,392, Feb. 19, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,551
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—455 **1 Claim**



1. A screen funnel comprising first and second separable parts, the first part comprising a plastic cone shaped funnel having a central axis, a larger diameter inlet top portion disposed concentrically about said axis, a smaller diameter outlet bottom portion disposed concentrically about said axis, said inlet and outlet portions connected together to form a contained flow path by means of a tapering conical center portion having generally smooth interior walls disposed substantially at a first angle from said axis with a plurality of small protrusions disposed generally concentrically about said axis and on said smooth conical interior walls, which protrusions have top facing surfaces slanting in from the interior walls at an angle from said axis only slightly greater than said first angle so as to present a minimum flow obstruction and bottom facing surfaces slanting out from the interior walls steeply so as to retain the second part thereunder; said second part comprising a plastic filtering element shaped in the form of a truncated cone disposed generally concentrically about said axis with the filter element walls disposed at a second angle from said axis, said second angle substantially similar to said first angle so that the filter element walls are positioned generally parallel to the funnel walls at a spaced distance therefrom, said filtering element also having a conical shaped entrance end with the conical entrance walls disposed at a third angle from said axis larger than the second angle so that said entrance end walls extend from the filter element walls to the interior walls of the funnel, the largest diameter of the conical entrance end of the filtering element being substantially equal to the diameter of the funnel at the point just below said

protrusions so that the filtering element fits snuggly under the protrusions and against the interior funnel walls, said entrance end beveled about the outside circumference to form a sharp edge with a conical outside surface at an angle from said axis about the same as said first angle so as to lay flatly against and form a tight seal with the interior funnel walls, and myriad perforations in the walls of the filtering element to form a liquid straining fluid passageway therethrough, said perforations excluded from the bottom portion of the filter element walls so as to form a sediment cup therein, with additional smaller perforations in the truncated portion of the filtering element to drain the sediment cup.

3,912,639
LUBRICANT CONTAINING ALKALI METAL BORATES AND PHOSPHATES

John H. Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 5, 1973, Ser. No. 376,831
Int. Cl.² C10M *1/40*
U.S. Cl. 252—33.4 **3 Claims**

1. A lubricating composition comprising (1) an oil of lubricating viscosity, (2) an amount effective to impart extreme pressure properties to said oil of an alkali metal borate and a trialkali metal phosphate, wherein said mixture is 99–30 molar percent of said borate and 1–70 molar percent of said phosphate, and (3) an amount effective to disperse said alkali metal borate and said trialkali metal phosphate of a mixture of dispersants, said mixture comprising 95–65 weight percent of a lipophilic anionic surface-active agent selected from the group consisting of alkali metal sulfonates and alkaline earth metal sulfonates and 5–35 weight percent of a lipophilic nonionic surface-active agent selected from the group consisting of N-substituted alkenyl succinimides of an alkylene polyamine.

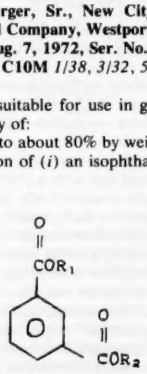
3,912,640
GAS TURBINE LUBRICANTS

Joseph F. Anzenberger, Sr., New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 7, 1972, Ser. No. 278,519
Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*
U.S. Cl. 252—47.5 **15 Claims**

1. A base stock suitable for use in gas turbine lubricants consisting essentially of:

a. from about 20 to about 80% by weight of the base stock of a combination of (*i*) an isophthalate ester having the formula:



wherein R_1 and R_2 are each a primary or secondary alkyl group having from 4 to 20 carbon atoms and (*ii*) an adipate ester derived from the esterification of adipic acid with C_6–C_{10} alkanols, wherein the combination of esters are present in lubricating amounts and the isothalate ester consists of at least 80% by weight of the combination; and

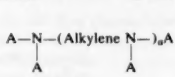
b. from about 80 to about 20% by weight of the base stock of a low viscosity mineral oil having a viscosity in the range from about 5 to about 10 centistokes at 210°F.

3,912,641
SULFUR AND NITROGEN-CONTAINING ORGANIC COMPOSITIONS PROCESSES FOR MAKING THEM AND FUELS AND ADDITIVES CONTAINING THEM

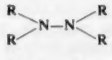
Herbert Frederick Wiese, deceased, late of Cleveland, Ohio (by Helen G. Weise, executrix), and Emil Thomas Wierber, Mayfield Village, Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Filed Sept. 27, 1973, Ser. No. 401,494
Int. Cl.² C10M *1/38*
U.S. Cl. 252—47.5 **14 Claims**

1. A lubricant or normally liquid hydrocarbon fuel composition containing a major amount of a lubricating oil or normally liquid hydrocarbon fuel and a minor amount sufficient to improve the detergency properties of said lubricant or fuel of a sulfur- and nitrogen-containing organic composition made by the process comprising reacting at a temperature above about 0°C. (A) at least one amino compound selected from a group consisting of monoamines substituted with C_1–C_{30} hydrocarbyl groups or hydroxy-substituted hydrocarbyl groups; heterocyclic amines selected from the group consisting of aziridines, azetidines, azolidines, tetra- and di-hydropyridines, pyrroles, piperidines, imidazoles, indoles, di- and tetrahydroimidazoles, piperazines, isoindoles, purines, morpholine, thiomorpholine, n-aminoalkylmorpholines, n-aminoalkylthiomorpholines, azepines, azocines, azoinines, azecinines, and tetra-, di- and perhydro derivatives of each of these; polyamines of the formula



wherein *a* is an average of integers between one and about ten, each A is independently a hydrogen atom, hydrocarbyl group, or hydroxy-substituted hydrocarbyl group having up to about thirty carbon atoms, with the proviso that two A groups can be taken together with an N— atom to form a ring of from five to six annular members and up to twelve carbon atoms and "Alkylene" is a lower alkylene group having between one and ten carbon atoms; hydrazines of the formula



wherein each R is independently hydrogen or C_1–C_{30} hydrocarbyl group; hydroxylamines of the formula

wherein the R groups have the same meaning described hereinabove; and ammonia; (B) carbon disulfide, and (C) at least one halogenated aliphatic hydrocarbon of at least about 25 carbon atoms wherein the ratio of (A) to (B) to (C) is about 0.5 to about 6.0 to about 0.5 to about 5.0 to 1.

3,912,642
ESTER LUBRICANTS SUITABLE FOR USE IN AQUEOUS SYSTEMS

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 384,674, Aug. 1, 1973, Pat. No. 3,857,865. This application Nov. 15, 1974, Ser. No. 523,990
Int. Cl.² C10M *1/06, 3/04, 5/04, 7/08*
U.S. Cl. 252—49.5 **4 Claims**

1. An aqueous lubricant composition suitable for metalworking and having improved rust protection properties containing about 0.1 to about 25 percent by weight of an ester comprising the condensation product of 0.05 to about 0.5 equivalent polyoxyalkylene glycol having a molecular weight from about 200 to about 1000 and having repeating alkylene

units containing from 2 to 4 carbon atoms, 0.5 to 0.95 equivalent monofuntional aliphatic alcohol of the formula ROH where R is an aliphatic hydrocarbon radical containing from 1 to about 20 carbon atoms and 1.0 equivalent of a dibasic acid containing from about 30 to 60 carbon atoms, said ester having an acid value less than 25, a hydroxyl value less than 25 and containing about 2 to about 40 percent by weight polyoxyalkylene glycol.

3,912,643

LUBRICANT CONTAINING NEUTRALIZED ALKALI METAL BORATES

John H. Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 5, 1973, Ser. No. 376,833
Int. Cl.² C10M *1/10*
U.S. Cl. 252—49.6 **4 Claims**

1. A lubricating composition comprising (1) an oil of lubricating viscosity and dispersed therein (2) an amount effective to impart extreme pressure properties to said oil of a hydrated borate of the formula:

$$xM_2O \cdot B_2O_3 \cdot yH_2O$$

wherein M represents an alkali metal, x represents a positive number of 0.75 to 3, and y represents a positive number of 0.5 to 4.5, said borate having been neutralized with sufficient acidic anions of phosphoric acid, sulfuric acid, or mixtures thereof such that an aqueous solution of said borate has a pH of 6–8.

3,912,644

LUBRICANT CONTAINING NEUTRALIZED POTASSIUM BORATES

John H. Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed July 5, 1973, Ser. No. 376,832
Int. Cl.² C10M *1/10*
U.S. Cl. 252—49.6 **4 Claims**

1. A lubricating composition comprising (1) an oil of lubricating viscosity and dispersed therein (2) an amount effective to impart extreme pressure properties to said oil of a hydrated borate of the formula:

$$xK_2O \cdot B_2O_3 \cdot yH_2O$$

wherein x represents a positive number of 0.25 to 0.74, and y represents a positive number of 0.5 to 4.5, said borate having been neutralized with sufficient acidic anions of phosphoric acid, sulfuric acid, nitric acid or mixtures thereof such that an aqueous solution of said borate has a pH of 6-9.

3,912,645

LIQUID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES

Virgil W. Westdale, Chagrin Falls, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Feb. 11, 1974, Ser. No. 441,635
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 **4 Claims**

1. As a liquid developer for latent electrostatic images having improved storage stability, a composition comprising a resin, a colorant, a vehicle, a metal drier, an antioxidant and an aryl-alkyl phosphite ester of the formula:

where R_1 is an aryl, R_2 is an alkyl and R_3 is selected from the group consisting of R_1 and R_2.

3,912,646

PRODUCTION OF ACICULAR MAGNETIC IRON OXIDES

Lutz Leitner, Rumeln-Kaldenhausen; Franz Hund, Krefeld-Bockum, and Jakob Rademachers, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 7, 1972, Ser. No. 313,072
Claims priority, application Germany, Dec. 17, 1971, 2162716
Int. Cl.² C04B *35/00*; C01G *49/06*
U.S. Cl. 252—62.56 **8 Claims**

1. In the production of acicular γ-ferromagnetic iron oxide needles from acicular iron oxide hydroxide needles prepared by precipitating at least one of iron (II) hydroxide and carbonate from an aqueous iron (II) salt solution by the addition of an aqueous solution containing a stoichiometric excess of at least one of an alkali hydroxide and carbonate, oxidizing the precipitated product into acicular α-iron oxide hydroxide under conditions which form the needles without formation of cubic crystals, separating the product of oxidation from the reaction medium, dehydrating the α-iron oxide hydroxide, reducing the resultant α-Fe_2O_3 to Fe_3O_4 and oxidizing the Fe_3O_4 to α-Fe_2O_3, the improvement which comprises carrying out the oxidation of the precipitated iron hydroxide or carbonate by passing a finely dispersed oxygen-containing gas through the solution at a volume ratio of from about 5:1 to 80:1 while stirring at an intensity such that the acicular iron oxide hydroxide accumulates in a volume-time yield of from about 6 to 25 g per liter per hour, about 10 to 50 percent of the iron (II) deposit being oxidized to the iron oxide hydroxide at about 10° to 55°C and the balance being oxidized at about 55° to 75°C., the resulting iron oxide hydroxide being substantially free of Fe_3O_4.

3,912,647

INVERT EMULSION FIRE EXTINGUISHING COMPOSITION AND METHOD

Franklin Z. Adell, 1429 Ardmoor, Birmingham, Mich. 48010

Filed Dec. 6, 1973, Ser. No. 422,425
Int. Cl.² A62C *1/06*
U.S. Cl. 252—8.05 **6 Claims**

1. A fire extinguishing composition, in the form of an invert emulsion and being of relatively thick viscosity, consisting essentially of,

a. at least one non-ionic surfactant means selected from the group consisting of
alkylphenoxy poly(oxyethylene) ethanols, and
b. water,

wherein the ratio of (b) to (a) is between about 5:1 and 35:1.

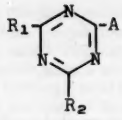
3,912,648

RING HALOGEN-FREE SUBSTITUTED TRIAZINE COMPOUNDS AS BLEACH ACTIVATORS

Thomas Eugene Brady, Piscataway, and Frank Fred Loffelman, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 21, 1973, Ser. No. 343,575
Int. Cl.² C11D *7/54*
U.S. Cl. 252—102 **10 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of a ring halogen-free triazine compound represented by the formula:



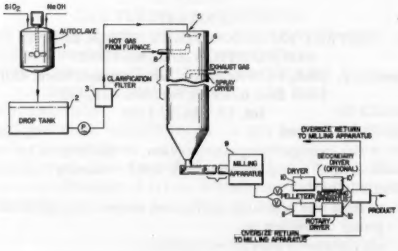
where A is a radical selected from the group consisting of pyridinium, dialkoxyphosphinyl, mercapto, (dialkylthiocarbamoyl)thio, alkyl sulfonyl, trihalomethyl and sulfophenoxy radicals; and R_1 and R_2 are individually selected from the group consisting of hydroxy, mercapto, alkyl, alkenyl, alkoxy, alkylmercapto, aryl, aryloxy, arylmercapto, dialkoxyphosphinyl and

where R_3 and R_4 are individually selected from the group consisting of hydrogen, alkyl, cyanoalkyl, hydroxyalkyl, carboxyalkyl, chloroalkyl, alkoxyalkyl, sulfoalkyl, aryl, sulfoaryl, acylaminoalkyl and carbamoylalkyl, and where R_3 and R_4 taken together are joined to complete a heterocyclic ring selected from the group consisting of morpholine, piperazine and piperidine rings.

3,912,649
DETERGENT COMPOSITION EMPLOYING ALKALI METAL POLYSILICATES

Orlando L. Bertorelli; Robert K. Mays, both of Havre de Grace; Lloyd E. Williams, Bel Air, all of Md., and Howard F. Zimmerman, Jr., Athens, Tenn., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 193,485, Oct. 28, 1971, Pat. No. 3,838,192. This application Aug. 26, 1974, Ser. No. 500,831
Int. Cl.² C11D *3/08*
U.S. Cl. 252—135 **2 Claims**



1. A washing composition comprising a synthetic organic detergent selected from the group consisting of anionic, nonionic and amphoteric surface active compounds and an alkali metal polysilicate builder, said polysilicate being the product of the method comprising the steps of subjecting an aqueous dispersion including finely divided silica and an alkali metal hydroxide, selected from the group consisting of sodium, potassium, lithium, and cesium hydroxide, to hydrothermal treatment at a temperature in the range of from about 280°F to 410°F, for a period of time effective to react said silica and said hydroxide to form a silicate that is partially polymerized; said dispersion of said silica and hydroxide having a SiO_2/Na_2O weight ratio of at least 1.8:1; passing said reaction mixture into the upper portion of a drying chamber and dispersing said mixture in the form of fine droplets in said chamber; contacting said droplets with a mass of upwardly directed air at a temperature of at least 400°F. sufficient to dry said droplets in the form of minute hollow spheres; fracturing and pulverizing said hollow spheres so that the density of the resulting fractured particles is at least 30 pounds per cubic foot; agitating the fractured particles while maintaining said particles at a temperature of at least 70°C. to round off the sharp edges thereof and contacting said particles with a mass of air at a temperature sufficient to reduce the moisture content of said particles to less than 25 percent; said detergent and said builder being present in said washing composition in a weight ratio of from 1:10 to 10:1.

3,912,650
HYDRATED ZINC BORATE, DIMETHYL SILICONE RESIN ARC EXTINGUISHING MATERIAL

Joseph M. Khalid, and Richard W. Niccolls, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed May 29, 1973, Ser. No. 364,597
Int. Cl.² H01B *3/46*
U.S. Cl. 252—63.5 **5 Claims**

1. An arc-extinguishing material comprising a filler of hydrated zinc borate in a dimethyl silicone resin, the carbon atoms in said resin being no greater than 15 percent of the total number of atoms in said hydrated zinc borate and dimethyl silicone resin combined.

3,912,651
ANHYDROUS ORGANOSILICON FLUIDS

Paul L. Brown, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed July 9, 1973, Ser. No. 377,492
Int. Cl.² C09K *5/00*
U.S. Cl. 252—78 **4 Claims**

1. A composition of matter consisting essentially of (1) a trimethylsiloxy endblocked polydimethylsiloxane fluid having a viscosity of from 0.65 to 1,000,000 cs. and (2) a silane of the formula $(CH_3)_3Si(OOCR)_3$ in which R is an alkyl radical of from 5 to 8 carbon atoms, (2) being present in amount sufficient to remove from the mixture up to 1% by weight water based on the weight of (1).

3,912,652
DEFOAMING COMPOSITION USEFUL IN JET DYEING

Joseph A. Colquhoun, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 17, 1973, Ser. No. 425,371
Int. Cl.² B01D *19/04*; C09B *67/00*
U.S. Cl. 252—358 **6 Claims**

1. A composition suitable for defoaming aqueous media consisting of

1. from 80 to 96 percent by weight of a water soluble copolymer of the group consisting of
$R_aSi(OSiMe_2)_n(OSiMeG)_mOSiMe_2G_{4-a}$,
$R_aSi(OSiMe_2)_n(OSiMeG)_mOSiMe_{3-a}$,
$GMe_2Si(OSiMe_2)_n(OSiMeG)_mOSiMe_2G$ and
$Me_3Si(OSiMe_2)_n(OSiMeG)_mOSiMe_3$ in which
Me is the methyl radical,
n has an average value from 6 to 400,
m has an average value from 3 to 30,
a has a value from 0 to 1,
R is a hydrocarbon radical free of aliphatic unsaturation of from 1 to 10 carbon atoms,
G is a radical of the formula $—D(OR')_xOA$ in which
D is an alkylene radical of 2 to 10 carbon atoms,
R' is $—CH_2CH_2—$ or a combination of $—CH_2CH_2—$ and

$$-\overset{CH_3}{\overset{|}{C}}HCH_2-,$$

y has an average value of at least 5 and

A is hydrogen or a capping group of from 1 to 10 carbon atoms and

2. from 4 to 20 percent by weight of a copolymer compatible with (1) prepared by condensing

B. a siloxane containing SiOH groups and being essentially of $Me_3SiO_{.5}$ and SiO_2 units in the mol ratio of from 0.4:1 to 1.2:1 and

C. a polyether of the group consisting of polyethylene oxide, polypropylene oxide, and copolymers thereof in (2) the weight ratio of (B) to (C) being in the range 15 to 50 percent (B) to 50 to 85 percent (C).

3,912,653

WATER-SOLUBLE INSPECTION PENETRANT COMPOSITION EMPLOYING DIMETHYL NAPHTHALENE

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 127,681, March 24, 1971, which is a continuation-in-part of Ser. No. 787,381, Dec. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 675,896, Oct. 17, 1967, Pat. No. 3,429,826, which is a continuation-in-part of Ser. No. 520,393, Jan. 14, 1966, Pat. No. 3,282,843, which is a continuation-in-part of Ser. No. 256,128, Feb. 4, 1963, abandoned. This application Aug. 6, 1973, Ser. No. 385,795

Int. Cl.² C09K *3/00;* **G01N** *31/00, 33/00;* **C09K** *11/00*

U.S. Cl. 252—408 **3 Claims**

1. A water-emulsifiable penetrant composition adapted for use in the penetrant method for detection of surface discontinuities, said composition consisting essentially of:

1. from 20 to 79 parts by weight of a light mineral oil having an aniline point within the range of about 150° F. to 200° F.,
2. from 1 to 40 parts by weight of a normally liquid nonionic surfactant having an HLB value within the range of about 10 to 20,
3. from 20 to 40 parts by weight of an aromatic solvent consisting essentially of a mixture of isomers of dimethyl naphthalene, and
4. from zero to 10 part by weight of an indicator dye, the proportional concentration of said aromatic solvent being sufficient to provide a cloud point of the mixture within a temperature range of from about 70° F. down to about 20° F.

3,912,654

USE OF PERFLUORALKYLPHOSPHORUS COMPOUNDS AS FOAM-DAMPENING AGENTS

Christian Held, Frankfurt am Main; Dieter Hoffmann, Burghausen, and Johannes Polster, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Frankfurt, Germany

Filed July 9, 1973, Ser. No. 377,561

Claims priority, application Germany, July 11, 1972, 2233941

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 **4 Claims**

1. In the process of dampening foaming of a liquid by the addition of foam-dampening agent thereto, the improvement which comprises employing, as foam-dampening agent, a member selected from the group consisting of

$$R_{(3-x)}PO(OH)_x$$

and the tertiary ammonium, alkali metal and alkali earth metal salts thereof wherein R is C_nF_{2n+1}, *n* is an integer from 4 to 24 and *x* is 1 or 2.

3,912,655

REAGENT IMPREGNATED PAPER STRIPS FOR USE IN PREPARING TLC SPRAY REAGENTS

Ravindra Shivprasad Shukla, and Mary Ann Zitka, both of Wallington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,565

Int. Cl.² C09K *3/00;* **G01N** *31/00, 33/00, 29/02*

U.S. Cl. 252—408 **6 Claims**

1. A dry visualization reagent impregnated paper strip for use in preparing a spray reagent solution standard for visualization of a drug in urine in thin-layer chromatography which comprises a paper strip containing impregnated therein the dried residue of a completely impregnated volume of liquid solvent solution containing a predetermined amount of visualization reagent capable of elution into a spray reagent solvent and of chemically reacting with a drug in said urine to produce a characteristic color for said drug on a chromatogram.

3,912,656

VANADATE OXIDE AND SILANOL CATALYST SYSTEM

David Arthur Andrews, Upper Montclair, N.J., and Nathan Chadwick Hindley, Welwyn Garden City, England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 29, 1973, Ser. No. 410,930

Claims priority, application United Kingdom, Nov. 2, 1972, 50558/72

Int. Cl.² B01J *31/12*

U.S. Cl. 252—431 R **4 Claims**

1. A catalyst system consisting essentially of a mixture of a vanadate catalyst of the formula:

$$[(R_4)_3Si-O]_m-\overset{\overset{O}{\|}}{\underset{[OR]_n}{\underset{|}{V}}}$$

wherein R_4 is lower alkyl, higher alkyl, cycloalkyl, aryl or aryl lower alkyl, said cycloalkyl or aryl is unsubstituted or substituted with lower alkyl, R is R_4 or $(R_4)_3Si-$; *m* is an integer of from 1 to 3; and *n* is an integer of 0 to 2, with the proviso that the sum of *m* and *n* is 3; and at least 0.05 mole percent, based upon the moles of said siloxy vanadium oxide of a silanol of the formula:

$(R_5)_3-SiOH$

wherein R_5 is lower alkyl, higher alkyl, cycloalkyl, aryl or aryl lower alkyl where the cycloalkyl or the aryl is unsubstituted or substituted with lower alkyl.

3,912,657

PROCESS FOR PREPARING RUTHENIUM PHOSPHATES AND USE THEREFOR

Thaddeus P. Kobylinski, Cheswick, and Brian W. Taylor, Richland Township, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 2, 1973, Ser. No. 375,533

Int. Cl. B01j *11/82*

U.S. Cl. 252—437 **14 Claims**

1. A process for preparing a new composition which consists essentially of contacting a mixture consisting essentially of (1) a phosphorus acid or a phosphorus oxide, (2) ruthenium, a ruthenium oxide or an inorganic ruthenium salt and (3) a refractory material selected from the group consisting of an aluminum oxide or an inorganic aluminum salt, silica, silica alumina, a magnesium oxide or an inorganic magnesium salt, and combinations of such refractory materials, wherein the molar ratio of said phosphorus component, said ruthenium component and said refractory component, based on the cationic portion thereof, is about 1:1:1 to about 1:200:20,000, with gaseous ammonia or H_2S at a temperature of about 0° to about 50° C. for about one-half to about 5 hours and then heating said mixture in an atmosphere containing molecular oxygen at a temperature of about 400° to about 1500° C. and

a pressure of about 0 to about 140 pounds per square inch gauge for about one minute to about 36 hours to obtain a novel ruthenium phosphate.

3,912,658
FIBER IMPREGNATED REINFORCED CATALYST CARRIER AND A PROCESS FOR THE PRODUCTION THEREOF

Yasuhisa Kaneko, and Fumiyoshi Noda, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 30, 1973, Ser. No. 355,429
Claims priority, application Japan, May 4, 1972, 47-44469
Int. Cl.² B01J *29/06, 23/08*
U.S. Cl. 252—455 R **2 Claims**

1. A fiber-impregnated reinforced catalyst carrier characterized in that ceramic fibers of Al_2O_3—SiO_2 or ZrO_2 having a diameter of 1 to 10μ and a length of 1 to 3 mm are dispersed in the ceramic catalyst carrier material in the amount of 2–5 weight percent.

2. The ceramic catalyst carrier of claim 1, wherein said ceramic catalyst material is ρ-alumina, γ-alumina, cordierite or mullite.

3,912,659
CATALYST FOR CONVERSION OF ALKYLAROMATICS

John T. Brandenburg, Hopewell Junction; Robert M. Suggitt, Wappingers Falls, both of N.Y., and Thomas M. Liden, Los Angeles, Calif., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 253,555, May 15, 1972, Pat. No. 3,792,098. This application May 15, 1973, Ser. No. 360,503
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 Z **7 Claims**

1. A composite catalyst comprising hydrogen mordenite having a silica to alumina mole ratio of between about 12:1 and 80:1, an eta or gamma binder and a sulfided Group VIII metal impregnated on said mordenite, said alumina comprising from 10 to 50 weight percent of said composite catalyst.

3,912,660
METHOD FOR MAKING HIGH SURFACE AREA MOLYBDENUM METAL

George A. Tsigdinos; Calvin J. Hallada, both of Ann Arbor, and Robert W. McConnell, South Lyon, all of Mich., assignors to AMAX Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,487
Int. Cl.² B01J *23/16*
U.S. Cl. 252—465 **10 Claims**

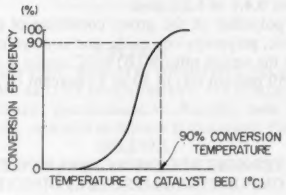
1. A process for preparing metallic molybdenum of high surface area which comprises the steps of providing a molybdenum compound consisting essentially of aquaoxalatomolybdic (VI) acid, and thereafter heating said molybdenum compound at a temperature of from about 400° up to about 600°C in a hydrogen reducing atmosphere for a period of time sufficient to thermally decompose and volatilize the oxalate constituent of said compound and to reduce substantially all of the molybdenum constituent thereof to a metallic state.

5. The process as defined in claim 1, including the further step of applying an aqueous solution containing from about 1% up to about 60% by weight of said molybdenum compound dissolved therein to a porous catalyst support in a manner to effect an impregnation thereof and a deposition of a coating of said molybdenum compound on the surfaces thereof which thereafter is heated at said temperature in said hydrogen reducing atmosphere.

3,912,661
METHOD OF PREPARING CATALYST CARRYING METALLIC CATALYST

Kiyoshi Numagami, Yokohama; Toshiki Okuyama, Fujisawa, and Tadanari Kato, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 2, 1973, Ser. No. 329,066
Claims priority, application Japan, Feb. 8, 1972, 47-013260
Int. Cl.² B01J *23/08*
U.S. Cl. 252—466 PT **11 Claims**



1. A method of preparing a catalyst, which comprises:
preparing either an aqueous or alcohol solution of a catalytic metal compound selected from the group consisting of platinum, palladium, rhodium, iridium, osmium and ruthenium and an aluminum salt which is soluble in either water or alcohol;
impregnating a catalyst carrier with said solution;
converting said aluminum salt in said solution into gelled aluminum hydroxide by neutralizing with an alkali for fixing said catalytic metal compound with said aluminum salt onto said catalyst carrier;
drying said catalyst carrier; and
sintering the dried catalyst carrier in the atmosphere of either hydrogen or air at a high temperature.

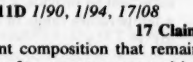
3,912,662
LIQUID DETERGENT COMPOSITION CONTAINING AN AMPHOLYTIC BETAINE-TYPE DETERGENT

Eva Margareta Martinsson, Stenungsund; Karl Martin Edvin Hellsten, Odsmal, and Anna Kristina Sterky, Spanga, all of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

Filed Nov. 28, 1973, Ser. No. 419,857
Claims priority, application Sweden, Nov. 30, 1972, 15647/72
Int. Cl.² C07C *101/12;* **C11D** *1/90, 1/94, 17/08*
U.S. Cl. 252—527 **17 Claims**

1. An aqueous liquid detergent composition that remains clear and liquid over a wide range of temperatures comprising:
a. from about 2 to about 25% by weight of an ampholytic betaine surfactant having the formula:

$$RO(C_{x_1}H_{2x_1}O)_{m_1}(C_{x_2}H_{2x_2}O)_{m_2}(C_{x_3}H_{2x_3}O)_{m_3}$$



wherein:
R is selected from the group consisting of aliphatic and cycloaliphatic groups having from six to about 22 carbon atoms and aromatic groups linked to the oxygen of the OR group via a carbon of the aromatic nucleus and having from one to six alkyl groups totalling from about four to about 18 carbon atoms in the alkyl groups, each alkyl group having from one to about 18 carbon atoms; R_1 and R_2 are selected from the group consisting of alkyl groups having from one to about three carbon atoms;

n_1, n_2 and n_3 represent the number of carbon atoms in each unit, and are within the range from about 2 to about 4;

m_1, m_2 and m_3 represent the number of oxyalkylene units, and are within the range from 0 to about 10, at least one of m_1, m_2 and m_3 is 1, and the sum of m_1, m_2 and m_3 is within the range from 1 to about 10;

n_4 represents the number of carbon atoms in the unit, and is within the range from 1 to about 4.

b. from about 1 to about 20% by weight of a nonionic surfactant having the formula:

$$R_3O(C_2H_4O)_{m_4}H$$

wherein:

R_3 is selected from the group consisting of aliphatic and cycloaliphatic hydrocarbon groups having from eight to 20 carbon atoms, and mono- and dialkyl phenyl groups having from about four to about 18 carbon atoms in the alkyl groups;

m_4 is a number within the range from about 5 to about 30; and

c. from about 1 to about 15% by weight of a complexing agent,

said components (*a*), (*b*) and (*c*) being dissolved in an amount of an aqueous medium sufficient to provide a clear liquid formulation.

3,912,663
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 156,933, June 25, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,482

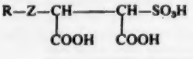
Int. Cl.² C11D *1/12, 3/34;* **C07C** *143/12*

U.S. Cl. 252—542 **23 Claims**

1. A detergent composition consisting essentially of

a. at least one detergent surface active agent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic agents; and,

b. from about 5 to about 95 weight percent of an organic detergent builder selected from the group consisting of an alkali metal, ammonium monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium and N-ethylmonoethanolammonium salts and mixtures thereof of an α-substituted-β-sulfo-succinate having the general formula



wherein;

R is selected from the group consisting of

1. alkyl containing 1 – 30 carbon atoms,
2. phenyl,
3. carboxy-substituted phenyl further containing mono-, di or tri-alkyl substituents wherein the alkyl groups contain 1–4 carbon atoms,
4. sulfoxyalkyl and carboxyalkyl wherein the alkyl moiety contains 1–4 carbon atoms, and
5. $R'Z(CH_2CH_2O)n—CH_2CH_2$ wherein
   a. R′ is hydrogen or alkyl containing 1–24 carbon atoms,
   b. Z is selected from the group consisting of O, S, SO_2 and SO,

and,

c. *n* is an integer of 0–15; and Z is as previously defined.

3,912,664
RECOVERY OF FLEXIBLE AND RIGID MATERIALS FROM SCRAP POLYVINYLCHLORIDE, ITS COPOLYMERS AND COGENERS

Eugene Wainer, Cleveland, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio

Filed Aug. 23, 1974, Ser. No. 500,118

Int. Cl.² C08J *11/02, 11/04*

U.S. Cl. 260—2.3 **16 Claims**

1. A process for the recovery of a reusable polyvinylchloride base composition from scrap material consisting of the constituents to be reused and contaminants associated therewith, which process comprises:

comminuting the scrap material into small pieces;

digesting the small pieces of scrap in a polar aprotic solvent for any polyvinylchloride polymer and copolymer in said scrap, for a time sufficient to effect complete dissolution of the polyvinylchloride polymer and copolymer content of said scrap;

filtering the resulting mixture and separately recovering a liquid filtrate containing the polymer content, in solution, and a solid residue containing constitutents of said scrap material which did not dissolve in said polar aprotic solvent;

then precipitating the polymer from solution in said filtrate by flushing said polymer from said solution in said filtrate by addition of a flushing liquid selected from the group consisting of water, saturated hydrocarbons having boiling points at least 50°C less than the boiling point of said polar aprotic solvent and which does not form an azeotrope with said polar aprotic solvent and mixtures consisting of said saturated hydrocarbons and lower aliphatic (C_1 – C_4) alcohols:

and recovering the precipitated solid polymer containing material, separately from the liquid in which it was precipitated.

3,912,665
EMULSIFIED PROPELLANT COMPOSITIONS FOR FOAMED STRUCTURES SUCH AS APPLICATOR PADS, AND PROCESS

Joseph George Spitzer, 722 Cove Road East, Mamaroneck, N.Y. 10543; Marvin Small, 1100 Park Ave., New York, N.Y. 10028; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011, and Dorothea C. Marra, 107 Fernwood Raod, Summit, N.J. 07901

Continuation-in-part of Ser. No. 166,960, July 28, 1971, abandoned, and a continuation-in-part of Ser. No. 5,150, Jan. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 797,257, Feb. 6, 1969, abandoned. This application Jan. 17, 1973, Ser. No. 324,472The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² C08J *9/12, 9/263n*

U.S. Cl. 260—2.5 E **30 Claims**

1. A polymer-propellant-in-organic-liquid emulsion comprising an organic liquid that is a liquid at atmospheric temperature and pressure, an additive, a film-forming synthetic polymer, and a liquid propellant boiling below 45°F. at atmospheric pressure, in a continuous organic liquid phase and a discontinuous propellant phase; the organic liquid comprising the continuous organic liquid phase, and the continuous organic liquid phase comprising from about 10% to about 75% by weight of the total emulsion; and the film-forming synthetic polymer being in solution in the propellant phase, the propellant phase comprising from about 10% to about 70% dissolved

polymer, and from about 90% to about 25% by weight of the total emulsion; and the propellant being retained in the liquid phase at a superatmospheric pressure; the emulsion quickly forming upon rapid volatilization of the propellant at atmospheric temperature and pressure a coherent, voluminous foamed structure composed of a matrix of synthetic polymer containing cells or pores; the additive being dispersed or dissolved in the emulsion, and deposited with the organic liquid and the additive in the cells or pores thereof, when the propellant volatilizes, and removable in liquid form from the cells or pores of the structure.

3,912,666

EMULSIFIED PROPELLANT COMPOSITIONS FOR FOAMED STRUCTURES SUCH AS APPLICATOR PADS, AND PROCESS

Joseph George Spitzer, 722 Cove Road, Mamaroneck, N.Y. 10543; Marvin Small, 1100 Park Ave., New York, N.Y. 10028; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011, and Dorethea C. Marra, 107 Fernwood Road, Summit, N.J. 07901

Continuation-in-part of Ser. No. 166,960, July 28, 1971, abandoned, and a continuation-in-part of Ser. No. 5,150, Jan. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 797,257, Feb. 6, 1969, abandoned. This application June 4, 1973, Ser. No. 366,939The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.[2] C08J *9/12, 9/26, 9/30*

U.S. Cl. 260—2.5 E **45 Claims**

1. An oil-in-water propellant emulsion comprising a film-forming synthetic polymer, an additive, a liquid propellant boiling below 45°F. at atmospheric pressure, a foam-stabilizing agent and water, in a continuous aqueous phase and a discontinuous propellant phase; the foam-stabilizing agent and water comprising the continuous aqueous phase, and the continuous aqueous phase comprising from about 10% to about 75% by weight of the total emulsion; and the film-forming synthetic polymer being in solution in the propellant phase, the propellant phase comprising from about 10% to about 70% dissolved polymer, and from about 90% to about 25% by weight of the total emulsion; and the propellant being retained in the liquid phase at a superatmospheric pressure; the emulsion quickly forming upon rapid volatilization of the propellant at atmospheric temperature and pressure a coherent, voluminous foamed structure composed of a matrix of synthetic polymer containing cells or pores; and the additive being dispersed or dissolved in the emulsion and deposited with the continuous aqueous phase in the cells or pores of the structure when the propellant volatizes, and removable in liquid form from the cells or pores of the structure.

3,912,667

STRUCTURES SUCH AS APPLICATOR PADS FOR CLEANING AND OTHER PURPOSES, PROPELLANT COMPOSITIONS FOR FORMING THE SAME AND PROCESS

Joseph George Spitzer, 722 Cone Road East, Mamaroneck, N.J. 10543; Marvin Small, 1100 Park Ave., New York, N.Y. 10028; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011, and Dorothea C. Marra, 107 Fernwood Road, Summit, N.J. 07901

Continuation of Ser. No. 180,170, Sept. 13, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 797,257, Feb. 6, 1969, abandoned, and Ser. No. 5,150, Jan. 22, 1970, abandoned, and Ser. No. 166,960, July 28, 1971. This application May 17, 1974, Ser. No. 469,718The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.[2] C08J *9/12, 9/26, 9/30*

U.S. Cl. 260—2.5 E **37 Claims**

1. A liquid propellant composition comprising a liquid propellant phase comprising a solution containing a film-forming synthetic polymer selected from the group consisting of thermoplastic resins, thermosetting resins in a thermoplastic propellant-soluble state, and cross-linkable resins in a thermoplastic propellant-soluble state in an amount within the range from about 10 to about 60% by weight of the composition and a liquid propellant boiling below 45° F. at atmospheric pressure and retained in the composition in the liquid phase at a superatmospheric pressure, the propellant being inert to the synthetic polymer and the additive, and being in a sufficient amount within the range from about 20 to about 70% by weight of the composition to form upon rapid volatilization of the propellant at atmospheric temperature and pressure a coherent, voluminous foamed structure containing open and/or closed cells; the composition also comprising an additive which is in an amount within the range from about 5 to about 700% by weight of the polymer, in excess of the amount soluble in the polymer in the absence of the propellant, and which is deposited in the cells or cells and walls of the structure when the propellant volatilizes, and which can be removed in liquid form from the cells of the structure by compression of the structure or by leaching with a solvent in which the additive is soluble but in which the foamed structure is insoluble, any organic liquid present which is a solvent for the polymer and boils at or about 45° F at atmospheric pressure and which is in the propellant phase being in an amount from about zero up to about three times the amount of polymer present in the propellant phase.

3,912,668

CONDUCTIVE PAINT FORMULATIONS WITH VERY LOW ELECTRICAL IMPEDANCE IN THE Z-DIRECTION CONTAINING A METAL CARBIDE

Edward W. Neumann; Francis J. Rahemba, and Stanley Scheinberg, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1974, Ser. No. 479,975

Int. Cl.[2] C23F *5/02*

U.S. Cl. 260—18 PN **4 Claims**

1. A conductive paint formulation including:

10 to 40% by dry weight metallic carbide of the structure MC; wherein M is selected from the group consisting of titanium, zirconium, niobium, hafnium, tantalum and tungsten; and wherein the carbide particles are up to 44 microns in size.

3,912,669

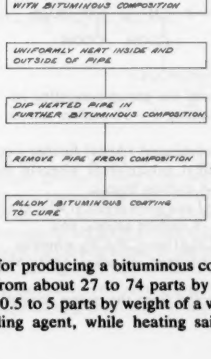
BITUMINOUS COATING SYSTEM AND ARTICLES PRODUCED THEREBY

Palmer G. Hendrix, Hickory, N.C., assignor to The Hill & Griffith Company, Cincinnati, Ohio

Filed Jan. 15, 1973, Ser. No. 323,443

Int. Cl.[2] C08L *95/00;* **C09D** *3/24*

U.S. Cl. 260—23 R **4 Claims**


PRESSURE COAT INSIDE OF PIPE AND FILL ANY HOLES WITH BITUMINOUS COMPOSITION
UNIFORMLY HEAT INSIDE AND OUTSIDE OF PIPE
DIP HEATED PIPE IN FURTHER BITUMINOUS COMPOSITION
REMOVE PIPE FROM COMPOSITION
ALLOW BITUMINOUS COATING TO CURE

1. A process for producing a bituminous composition comprising mixing from about 27 to 74 parts by weight of water and from about 0.5 to 5 parts by weight of a water-dispersible polymeric bonding agent, while heating said mixture to a

temperature from about 170° to 210°F. to disperse said bonding agent throughout the water; cooling the dispersion to a temperature from about 20° to 140°F.; adding from about 0.5 to 3 parts by weight of a wetting agent, during mixing to disperse said wetting agent; adding from about 25 to 65 parts by weight of a bituminous material having a melting point in the range of about 160° to 420°F., and mixing to disperse said asphaltic material to produce said bituminous material, said bituminous material thereupon swelling and causing substantial sudsing.

3,912,670

RADIATION CURABLE CAN COATING COMPOSITION

Thomas F. Huemmer, South Bend, and Ronald J. Plooy, Mishawaka, both of Ind., assignors to The O'Brien Corporation, South Bend, Ind.

Filed Feb. 28, 1973, Ser. No. 336,625
Int. Cl.² C08L *91/00, 33/04*
U.S. Cl. 260—23 EP **11 Claims**

1. A radiation curable coating composition for metal containers which comprises from about 10–78% by weight of a radiation curable oil wich is the reaction product of up to about one mole of a long chain fatty acid, and at least 1.5 moles of acrylic acid, with one mole of a low molecular weight polyfunctional material selected from the group consisting of polyols and polyepoxy resins, said polyfunctional material having a functionality of at least about 2.5, said radiation curable oil having from about two to about six radiation sensitive acrylate groups per 1000 molecular weight, and an average molecular weight between 300 and 2000; from about 2–40% by weight of a flow control additive; and from about 20–80% by weight of a solvent, said solvent being selected from the group consisting of acrylic acid and mixtures of acrylic acid with another acrylic monomer having surface tension no higher than about 45 dynes per cm, said acrylic acid comprising at least 20% by weight of said coating composition, said coating composition being substantially free of non-converting solvents.

2. A radiation curable coating composition for metal containers which comprises from about 10–78% by weight of a mixture of a radiation curable oil and a radiation curable oligomer, said radiation curable oil being the reaction product of acrylic acid or methacrylic acid and a vegetable oil derivative and having from about 2 to about 6 radiation sensitive sites per 1,000 molecular weight and an average molecular weight between about 300 and 2,000; said radiation curable oligomer having an acrylate functionality of at least 2 and an acrylate equivalent weight of no more than about 300; said mixture containing from about 0.5 to about 3 parts by weight of a radiation curable oligomer for each part by weight of radiation curable oil; from about 2–40% by weight of a flow control additive; and from abut 20–80% by weight of a solvent, said solvent being selected from the group consisting of acrylic acid and mixtures of acrylic acid with another acrylic monomer having a surface tension no higher than about 45 dynes per cm, said acrylic acid comprising at least 20% by weight of said coating composition, said coating composition being substantially free of non-converting solvents.

3,912,671

FLAME-RETARDANT RESINOUS COMPOSITION

Renichi Kondo, Tokyo; Koji Nakagawa, Asahi; Makoto Fukuda, Sagamihara; Hiroshi Okai, and Ikuji Kishi, both of Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1974, Ser. No. 472,687
Int. Cl.² C08K *3/22*
U.S. Cl. 260—23 XA **7 Claims**

1. A flame-retardant composition, comprising 100 parts by weight of a thermoplastic resin or rubber and 50 to 300 parts by weight of a calcium aluminate type mineral having an average particle diameter in the range of from 1 to 200 μ and containing $3CaO.Al_2O_3.6H_2O$ as the principal component, the said thermoplastic resin or rubber being selected from group consisting of:

Polystyrene,
Acrylonitrile-styrene copolymer,
Methyl methacrylate-styrene copolymer,
Acrylonitrile-styrene-butadiene copolymer,
Polyvinyl chloride,
Vinyl chloride-propylene copolymer,
Vinyl chloride-vinylacetate copolymer,
Vinyl chloride-vinylidene chloride copolymer,
Polyethylene,
Polypropylene,
Ethylene-propylene copolymer,
Ethylene-vinylacetate copolymer,
Natural rubber,
Styrene-butadiene rubber,
Polybutadiene rubber, and
Polyisoprene rubber rubber.

3,912,672

ACRYLATE RUBBER VULCANIZABLE COMPOSITIONS

Roger E. Morris, Cuyahoga Falls, and Harold Tucker, Brecksville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 272,849, July 18, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,278
Int. Cl.² C08F *8/40, 8/42*
U.S. Cl. 260—23 AR **15 Claims**

1. A composition of (1) a rubber consisting essentially of (a) from about 40 percent to about 99.8 percent by weight of an acrylate or mixtures of acrylates of the formula

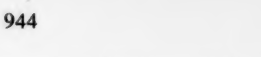
$$CH_2=CH-\overset{O}{\overset{\|}{C}}-O-R'$$

wherein R′ is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl, an alkylthioalkyl, and a cyanoalkyl radical each containing 2 to about 12 carbon atoms, (b) from about 0.1 percent to about 30 percent by weight of a halogen-containing monomer selected from the group consisting of vinyl chloroacetate, vinyl bromoacetate, allyl chloroacetate, vinyl chloropropionate, vinyl chlorobutyrate, vinyl bromobutyrate, 2-chloroethyl acrylate, 3-chloropropyl acrylate, 4-chlorobutyl acrylate, 2-chloroethyl methacrylate, 2-bromoethyl acrylate, 2-iodoethyl acrylate, 2-chloroethyl vinyl ether, chloromethyl vinyl ketone, 4-chloro-2-butenyl acrylate, vinyl benzyl chloride, 5-chloromethyl-2-norbornene, 5-(α-chloroacetoxymethyl)-2-norbornene, and 5-(α,β-dichloropropionylmethyl)-2-norbornene, (c) from about 0.1 percent to about 20 percent by weight of a carboxyl-containing monomer, and (d) up to 35 percent by weight of a copolymerizable monomer containing a terminal vinylidene group selected from the group consisting of vinyl acetate, methyl methacrylate, ethyl methacrylate, styrene, acrylonitrile, acrylamide, divinyl benzene, and diethylene glycol diacrylate, and (2) a cure system consisting essentially of from about 0.5 part to about 7 parts by weight based upon 100 parts by weight of the rubber of an alkali metal salt of an acid selected from the group consisting of carboxylic acids containing 2 to about 24 carbon atoms and organophosphoric acids wherein the organophosphoric acid alkali metal salts have the structure

$$(RO)_zPO_yOM$$

wherein M is an alkali metal, $y = 1$ or 2, $z = 1$ or 2, and $y + z = 3$, and R is selected from the group consisting of an alkyl radical cointaining 1 to 24 carbon atoms, an aryl radical containing 6 to 24 carbon atoms, and an alkylphenoxy poly(ethyleneoxy)ethyl radical.

9. A composition comprising (1) a rubber consisting essentially of (a) from about 40 percent to about 99.8 percent by weight of an acrylate or mixtures of acrylates having the formula



wherein R′ is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl radical, alkylthioalkyl radical, and a cyanoalkyl radical each containing 2 to about 12 carbon atoms, (b) from about 0.1 percent to about 30 percent by weight of a halogen-containing monomer selected from the group consisting of vinyl chloroacetate, vinyl bromoacetate, allyl chloroacetate, vinyl chloropropionate, vinyl chlorobutyrate, vinyl bromobutyrate, 2-chloroethyl acrylate, 3-chloropropyl acrylate, 4-chlorobutyl acrylate, 2-chloroethyl methacrylate, 2-bromoethyl acrylate, 2-iodoethyl acrylate, 2-chloroethyl vinyl ether, chloromethyl vinyl ketone, 4-chloro-2-butenyl acrylate, vinyl benzyl chloride, 5-chloromethyl-2-norbornene, 5-(α-chloroacetoxymethyl) 2-norbornene, and 5-(α,β-dichloropropionylmethyl)-2-norbornene, (c) from about 0.1 percent to about 20 percent by weight of a carboxyl-containing monomer, and (d) up to 35 percent by weight of a copolymerizable monomer containing a terminal vinylidene group selected from the group consisting of vinyl acetate, methyl methacrylate, ethyl methacrylate, styrene, acrylonitrile, acrylamide, divinyl benzene, and diethylene glycol diacrylate, and (2) a cure system consisting essentially of (i) from about 0.5 part to 7 parts by weight based upon 100 parts by weight of the rubber of an alkali metal salt of an acid selected from the group consisting of carboxylic acids containing 2 to about 24 carbon atoms and organophosphoric acids wherein the organophosphoric acid alkali metal salts have the structure

$$(RO)_zPO_yM$$

wherein M is an alkali metal, $y = 1$ or 2, $z - 1$ or 2, and $y + z = 3$, and R is selected from the group consisting of an alkyl radical containing 1 to 24 carbon atoms, an aryl radical containing 6 to 24 carbon atoms, and an alkylphenoxy poly(ethyleneoxy)ethyl radical, and (ii) a catalyst used at a level from about 0.01 part to about 5 parts by weight per 100 parts by weight of rubber, and wherein said catalyst is selected from the group consisting of quaternary ammonium salts and amines that have a dissociation constant of below 10.

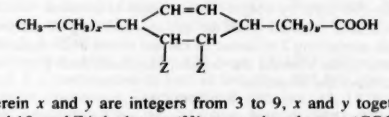
3,912,673
EMULSIFIER FOR ANIONIC POLYETHYLENE EMULSIONS

Carlton G. Force, Mount Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,635
Int. Cl.² C08F *10/02*; C09G *1/08*
U.S. Cl. 260—23 H **2 Claims**

1. Water-to-wax anionic polyethylene emulsions wherein the emulsified comprises,

a. from 5 to 95% by weight of the total emulsifier of a C_{21}-cycloaliphatic dicarboxylic acid having the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, and Z is hydrogen (H) or a carboxyl group (COOH) with one Z of each moiety,

b. from 0.1% by weight to 15% by weight of the total emulsifier of the unsaponifiable material in tall oil heads and wherein said unsaponifiable materials in tall oil heads are less than 5.0% by weight of said C_{21}-cycloaliphatic dicarboxylic acid, and

c. from 0 to 94% by weight of a fatty acid from the group consisting of oleic acid and tall oil fatty acids.

3,912,674
ETHYLENE COPOLYMER DISPERSIONS AS WATER REPELLENT COATINGS

Roland Edgar Stahl, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 355,501, April 30, 1973, abandoned. This application Sept. 12, 1974, Ser. No. 505,492
Int. Cl.² C08L *91/06*
U.S. Cl. 260—23 AR **6 Claims**

1. An aqueous dispersion comprising a mixture of (1) a dispersion of an ethylene copolymer comprising at least 30 percent by weight ethylene and up to 70 percent by weight of an alpha, beta-ethylenically unsaturated carboxylic acid, 40 to 75 percent of said acid groups being neutralized with alkali metal ions, and a paraffin wax, the dry weight ratio of wax to ethylene copolymer being 1:1 to 19:1, the ethylene copolymer and wax dispersion being held in dispersed phase by 1.0 to 15.0 percent by weight, based on the weight of ethylene copolymer and wax, of an amine soap surfactant, and (2) a terpolymer emulsion comprising 64 to 77 percent by weight vinyl acetate, 20 to 30 percent by weight ethylene and 3 to 6 percent by weight N-methylol acrylamide, the dry weight ratio of ethylene copolymer and wax dispersion to terpolymer emulsion being from 70:30 to 20:80.

3,912,675
FLEXO INK COMPOSITION

Hiroshi Hoshi, Narashino; Sakae Sakakura, Omiya; Minoru Yoshida, Tokyo; Yoshinobu Monden, Kasukabe; Fumio Ito, Chiba, and Kaoru Fujita, Ikeda, all of Japan, assignors to Sakata Shokai Ltd., Osaka and Lion Fat & Oil Co., Ltd., Tokyo, both of, Japan

Filed May 24, 1973, Ser. No. 363,577
Claims priority, application Japan, May 29, 1972, 47-53149
Int. Cl.² C08L *93/00*
U.S. Cl. 260—27 R **3 Claims**

1. In a flexo ink composition containing an organic solvent solution of a resin component as the vehicle, wherein the amount of said organic solvent is from 30 to 60 percent by weight, based on the weight of the flexo ink composition, the improvement which comprises:

said resin component consists essentially of

A. from 5 to 35 percent by weight, based on the weight of the flexo ink composition, of a copolymer of methacrylic acid ester and acrylic acid, said copolymer having a molecular weight in the range of 30,000 to 300,000 and a second order transition temperature in the range of 20° to 105°C, said methacrylic acid ester being selected from the group consisting of ethyl methacrylate, butyl methacrylate, isobutyl methacrylate, n-hexyl methacrylate, n-octyl methacrylate, lauryl methacrylate and stearyl methacrylate,

and B. from 5 to 20 percent by weight, based on the weight of the flexo ink composition, of dammar having an acid value in the range of 20 to 55 and a softening point in the range of 55° to 110°C,

said flexo ink composition possessing improved adhesion to untreated polyolefin sheets and to polyolefin sheets filled with inorganic powder.

3,912,676
POLYCHLOROPRENE-TACKIFYING RESIN DISPERSIONS

Donald Francis Brizzolara, Wilmington, Del., and Robert Roth Garrett, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 30, 1973, Ser. No. 365,275
Int. Cl.² C08L *93/00*, *61/06*
U.S. Cl. 260—27 BB **2 Claims**

1. In the process for producing a chloroprene-carboxylic acid copolymer latex having intimately dispersed therein an oil-soluble tackifying or reinforcing resin, soluble in the chloroprene monomer, said resin being selected from the group

consisting of para-substituted phenol-formaldehyde resins, coumarone-indene resins, and cyclopentadiene resins;

the improvement comprising the following steps:

1. preparing a solution of the resin in a mixture of chloroprene and α,β-unsaturated carboxylic acid monomer;
2. emulsifying the solution in water containing polyvinyl alcohol; and
3. polymerizing the monomers in the emulsion so formed in the presence of free-radical catalysts;

the chloroprene-carboxylic acid mixture of Step (1) containing 0.4–10 mole percent of the carboxylic acid based on the total of chloroprene plus carboxylic acid, and the tackifying or reinforcing resin being present in said mixture in the proportion of 5–75 parts; and the polyvinyl alcohol being present in Step (2) in the proportion of 2–10 parts; all parts being by weight per hundred parts of total chloroprene plus carboxylic acid monomers.

3,912,677
COMPOUNDS

Elizabeth Ann Baker, Glen Iris, and David Jankiel Wluka, Balaclava, both of Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Australia

Continuation of Ser. No. 142,050, May 10, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,807

Claims priority, application Australia, May 14, 1970, 1202/70

Int. Cl.² C08L *93/04*

U.S. Cl. 260—27 R **20 Claims**

1. A polymeric dispersant for dispersing organic pigment particles in an organic liquid, said dispersant being an addition copolymer having a molecular weight of 2,000 to 500,000 and being a copolymer obtained by copolymerization of a mixture of (i) 99 to 50 molar percent of an ethylenically unsaturated monomer containing at least one solubilizing group which is soluble to the extent of at least 20% by weight in said organic liquid, and (ii) 1 to 5 molar percent of an ethylenically unsaturated monomer containing at least one ionic acidic or basic group capable of forming a salt by reaction with a salt-forming component containing a complementary basic or acidic group and having a structure similar to that of the surface of the pigment particles.

3,912,678
COMPOSITION FOR EARTH COMPACTING

David Azar, and Keith P. Lanneau, both of Baton Rouge, La., assignors to Roadways International Corporation, Baton Rouge, La.

Division of Ser. No. 199,758, Nov. 17, 1971, Pat. No. 3,817,643. This application Nov. 28, 1973, Ser. No. 419,867

Int. Cl.² C08L *95/00*

U.S. Cl. 260—28.5 AS **6 Claims**

1. An article of commerce which is essentially an aqueous emulsion of earth-penetrating asphalt containing dispersed particles of calcium hydroxide in an amount greater that 5% based on the weight of the asphalt and so large that most of these particles do not dissolve but are suspended in the emulsion, the asphalt concentration being at least about 5% by weight of the composition.

3,912,679
SELF-POLISHING AGENT FOR SHOES AND OTHER LEATHER ARTICLES SUBJECT TO DISTORTION

Edelbert Bischoff, Kirchheimbolanden, and Willy Hessler, Weisbaden, both of Germany, assignors to Werner & Mertz GmbH, Mainz, Germany

Continuation of Ser. No. 274,722, July 24, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,239

Int. Cl.² C08L *91/06*

U.S. Cl. 260—28.5 R **3 Claims**

1. A composition for the self-gloss polishing of leather and leather-like articles which consists essentially of a hard wax in the form of a microcrystalline paraffin wax in an amount of 1 to 10 parts by weight in terms of the solids of the composition, said hard wax having a melting point of 130°C, a gelling point of 96°C, a saponification number of 130, an acid titer of 87 and a penetration of 2 under ASTM D1321; a styrene-maleic anhydride resin plasticized with epsilon caprolactam in an amount of 0.5 to 5 parts by weight of the solids of the composition; an aqueous synthetic-resin dispersion component, consisting of a styrene-acrylate copolymer intermolecularly reversibly cross-linked by zinc or zirconium in an amount of 5 to 20 parts by weight of the solids of the composition; 0.5 to 4 parts by weight of a non-ionic emulsifier; 0.5 to 4 parts by weight of a temporary plasticizer; 0.5 to 4 parts by weight of an ammonia solution in terms of 30% ammonia; 0.5 to 3 parts by weight of a fluorinated surface-active agent in terms of a 1% solution thereof and 0.05 to 0.3 parts by weight of a silicone defoamer.

3,912,680
LIGHT FAST POLYURETHANE UREA COATING SOLUTIONS

Harald Oertel, Odenthal-Gloebusch; Bruno Zorn, Cologne; Hans Joachim Koch, Leverkusen; Gerhard Berndt, Monheim, and Klaus Noll, Cologne, all of Germany, assignors to Bayer Aktiengeselschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 353,035, April 20, 1973, abandoned. This application July 22, 1974, Ser. No. 490,630

Claims priority, application Germany, May 4, 1972, 2221750

Int. Cl.² C08G *18/75;* **B32B** *27/40;* **D06N** *3/08*

U.S. Cl. 260—29.2 TN **8 Claims**

1. Stable solutions of polyurethane ureas from prepolymers with terminal isocyanate groups, and dihydrazide compounds in slightly polar, readily volatile solvents prepared by reacting

a. a prepolymer prepared from

i. polyhydroxyl compounds with a molecular weight of 500 to 5000 and

ii. an aliphatic or cycloaliphatic diisocyanate with a proportion of at least 75 mols % of 1 isocyanato-3-isocyanatomethyl-3,5,5-trimethylcyclohexane with

b. an aqueous solution of a dihydrazide compound which has been dissolved in 0.5 to 5 times its weight of water, the reaction being carried out in a solvent mixture comprising

i. aromatic hydrocarbons or aliphatic chlorinated hydrocarbons,

ii. aliphatic, or cycloaliphatic monohydric alcohols and

iii. water

the ratio of i/ii being between 1:10 and 10:1 and the total proportion of water in the solvent being between 0.5 and 15% by weight.

3,912,681

COMPOSITION FOR IMPARTING NON-PERMANENT SOIL-RELEASE CHARACTERISTICS COMPRISING AN AQUEOUS ACIDIC SOLUTION OF POLYCARBOXYLATE POLYMER

Robert E. Dickson, Belle Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 249,089, May 1, 1972. This application Nov. 12, 1973, Ser. No. 414,880The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.² D06M *15/14*

U.S. Cl. 260—29.6 H **23 Claims**

1. A composition for imparting non-permanent soil release characteristics to textile fabrics comprising an aqueous solution of a polymer derived from an ethenically unsaturated monocarboxylic acid and a lower alkyl acrylate or methacrylate, said polymer having an acid equivalent weight of from about 110 to 175 and a mineral acid present in an amount so that the pH of the solution of said composition is about 3.

3,912,682

LATEX COMPOSITIONS CONTAINING POLYMERS HAVING REACTIVE AZOLIDE CURE SITES

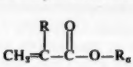
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 15, 1974, Ser. No. 460,825

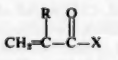
Int. Cl.² C08L *39/04, 33/08, 33/14, 33/22*

U.S. Cl. 260—29.7 H **7 Claims**

1. A latex composition comprising (A) 100 parts by weight of a latex containing a polymer consisting essentially of interpolymerized units of (1) from about 50 percent to about 99.5 percent by weight of an acrylic ester monomer of the formula



wherein R is hydrogen, or a methyl or ethyl radical and R_a is selected from the group consisting of alkyl radicals containing 1 to about 24 carbon atoms and alkoxyalkyl radicals containing 2 to about 12 carbon atoms total in the radical, (2) from about 0.5 percent to about 50 percent by weight of an ethylenically unsaturated azolide of the formula



wherein R is defined as above and X is an azole radical comprised of a five-membered unsaturated heterocyclic ring having at least two nitrogen atoms and two conjugated double bonds contained therein, where the carbonyl structure is directly attached to a nitrogen atom of the azole, and (3) up to 20 percent by weight of a copolymerizable vinylidene monomer, and (B) from about 0.5 part to about 10 parts by weight based upon 100 parts by weight of polymer in the latex of a di- or polyfunctional amine.

3,912,683

PROCESS FOR THE PREPARATION OF SULFOBUTYL LATEX

Charles P. O'Farrell, Clark, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 12, 1974, Ser. No. 487,907

Int. Cl. C08d *5/00*

U.S. Cl. 260—29.7 B **7 Claims**

1. In a process for preparing a latex of sulfonated butyl rubber sulfonated to at least 0.5 mole % SO_3H, the improvement which comprises:

a. preparing a cement of butyl rubber in an aromatic hydrocarbon solvent;

b. sulfonating the rubber;

c. neutralizing the rubber with a weak base selected from the group consisting of ammonium hydroxide and organo amines with a $pK_b > 3.0$; and

d. emulsifying the cement in water with an anionic emulsifying agent; and thereafter stripping off excess water.

3,912,684

PELLETIZED SEMI-VULCANIZED BUTYL RUBBER

John E. Callan, Trenton, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Jan. 18, 1974, Ser. No. 434,468

Int. Cl.² C08K *5/01, 3/36;* C08C *19/00*

U.S. Cl. 260—33.6 AQ **4 Claims**

1. A pelletized, contact-solvatable, non-remassable, semi-vulcanized butyl rubber composition having a Mooney viscosity (ML–3 at 260°F.) of about 25–40; said composition comprising a semi-vulcanized butyl rubber and, based on the weight of said rubber prior to vulcanization, about 10–40% by weight of plasticizer and about 10–50% by weight of inert filler.

3,912,685

POLYMER COMPOSITION

Francis Paul Gintz, London, England, assignor to BP Chemicals International Limited, England

Filed July 30, 1973, Ser. No. 383,963

Claims priority, application United Kingdom, Aug. 10, 1972, 37403/72

Int. Cl.² C08K *3/34*

U.S. Cl. 260—42.37 **5 Claims**

1. In a thermosetting moulding composition comprising (a) as its major polymerizable component (i) a high vinyl butadiene polymer containing at least 65% of 1,2-bonded units, and (ii) from 1 to 10%, based on the weight of said polymer, of an organic peroxide free radical initiator and (b) a filler as its major nonpolymerizable component, the improvement consisting of the presence of a shrink controlling amount of atactic polypropylene having a number average molecular weight in the range of 250 to 200,000, as a shrink controller.

3,912,686

NICKEL COMPLEX-HYDROXYBENZOTRIAZOLE STABILIZER SYSTEM FOR POLYOLEFINS

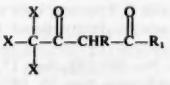
Ronald D. Mathis, Taylors, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1974, Ser. No. 456,839

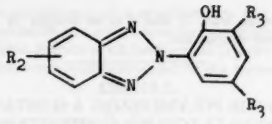
Int. Cl.² C08F *6/00*

U.S. Cl. 260—45.75 N **8 Claims**

1. A composition comprising polypropylene having ultraviolet light stabilizing amounts of first and second materials incorporated therein, said first material comprising at least one nickel complex of a halogenated betadiketone of the formula



where each X is fluorine, bromine, chlorine or iodine, R is hydrogen or a radical selected from alkyl, aryl, cycloalkyl and combinations thereof containing up to 20 carbon atoms or a heterocyclic radical containing 5 or 6 carbon atoms per ring, and R_1 is a radical selected from alkyl, aryl, cycloalkyl and combinations thereof containing up to 20 carbon atoms or a heterocyclic radical containing 5 or 6 carbon atoms per ring, said second material comprising at least one compound of the formula



in which R_2 is hydrogen, fluorine, bromine, chlorine or iodine, and each R_3 is hydrogen or an alkyl having up to 20 carbon atoms, the weight ratio of said first material to said second material being in the range of about 1:9 to about 3:2.

3,912,687
PROCESS FOR PREPARING HALOGEN-SUBSTITUTED AROMATIC POLYCARBONATES

Heinrich Haupt; Hugo Vernaleken, both of Krefeld; Kurt Weirauch, and Ulrich Haberland, both of Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

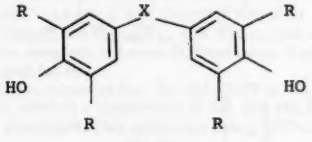
Filed Mar. 13, 1974, Ser. No. 450,947

Claims priority, application Germany, Mar. 30, 1973, 2315888

Int. Cl.² C08G *63/62, 75/28*

U.S. Cl. 260—47 XA **10 Claims**

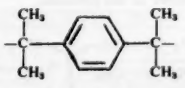
1. In a process for the preparation of polycarbonates which comprises reacting phosgene with an aromatic dihydroxy compound of the general formula



in which

R is chlorine or bromine and

X is C_1–C_8 alkylene, C_2–C_8 alkylidene, C_5–C_{15} cycloalkylene, C_5–C_{15} cycloalkylidene, a single bond, —O—, —S—, —SO—, —SO_2—, —CO— or



or a mixture of aromatic dihydroxy compounds of which at least 50 mol% is of the said formula in a phase boundary condensation process, the improvement wherein an aqueous-alkaline solution containing the compound of the formula is reacted with phosgene in a first stage at a pH of between 7 and 9 in the presence of about 2 mol% to 20 mol% (referred to the dihydroxy compound(s) employed) of a catalyst for the reaction to give an oligocarbonate with an end group ratio of chlorocarbonic acid ester to OH of greater than 1.1 to 1 respectively, and in a second stage the oligocarbonate is polycondensed at a pH of more than 13 and at an OH concentration (referred to the aqueous phase) between 0.2 and 0.4% by weight without any further addition of phosgene.

3,912,688
FLAMEPROOF POLYCARBONATES

Paul Schiller, Krefeld-Uerdingen; Ulrich Haberland, and Hugo Vernaleken, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Continuation of Ser. No. 261,202, June 9, 1972, abandoned. This application Feb. 12, 1974, Ser. No. 441,777

Claims priority, application Germany, June 12, 1971, 2129204

Int. Cl.² C08G *63/62*

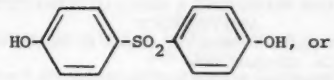
U.S. Cl. 260—49 **11 Claims**

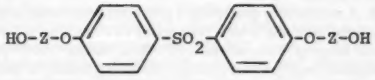
1. Copolycarbonates prepared by a process comprising reacting

a. a dihydroxydiaryl compound,

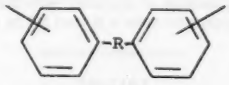
b. a nuclear-halogenated bishydroxyaryl compound, and

c. a bis-hydroxy sulfone of the formula





or mixtures thereof in which Z is phenylene, diphenylene, naphthylene or a bivalent radical of the formula



in which R is O, alkylene, alkylidene, cycloalkylene, cycloalkylidene, SO_2, SO, S or —CO,

with a carbonate precursor, selected from the group consisting of diarylcarbonates, phosgene, carbonyl bromide, bis-chloroformic acid esters of the aromatic dihydroxy compounds and mixtures of these precursors said polycarbonate containing from about 80–95.9 mol% of (a) from about 4–10 mol% of (*b*) and from about 0.1-10 mol% of (c).

3,912,689
DIALKYLAMINOALKYLIMIDAZOLES AS CATALYSTS FOR PREPARATION OF POLYURETHANES

Ibrahim Selim Bechara, Boothwyn, and Dewey G. Holland, Chadds Ford, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

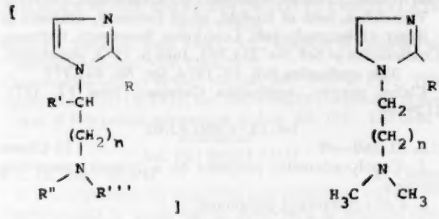
Division of Ser. No. 347,039, April 2, 1973, abandoned. This application May 8, 1974, Ser. No. 468,190

Int. Cl.² C08G *18/20*

U.S. Cl. 260—75 NC **4 Claims**

1. In the method of preparing polyurethane compositions from formulations comprising at least one polyol having a minimum of two active hydrogen atoms per molecule, a reactive, organic polyisocyanate, and a catalyst, the improvement in which the catalyst comprises an effective activating amount

of the dialkylaminoalkylimidazole of the formula



where

R is H or CH_3 and n is an integer from 1 to 2.

3,912,690
METHOD FOR PRODUCING A SHELLAC SUBSTITUTE AND PRODUCT

William J. Yapp, Park Forest, Ill., assignor to The Sherwin-Williams Co., Cleveland, Ohio

Filed Nov. 5, 1970, Ser. No. 87,314
Int. Cl.² C08G *63/12*
U.S. Cl. 260—75 EP **2 Claims**

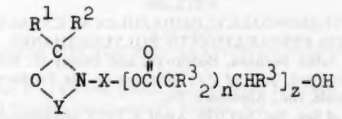
1. A method for preparing a polyester resin soluble in lower aliphatic alcohols which comprises (a) reacting at temperatures ranging from about 175°F and below 300°F phthalic anhydride with pentaerythritol; the total quantity of anhydride being not more than stoichiometrically equivalent to the hydroxyl groups of the pentaerythritol; maintaining the reaction temperature above about 175°F and below 300°F for sufficient time to half-esterify said anhydride to form the half-ester and (b) subsequently reacting said half-ester with at least two oxirane monomers having terminal epoxide groups; the major proportion of said oxirane monomers being propylene oxide with the other oxirane monomer containing a hydroxyl group; maintaining the reaction conditions for a time sufficient to esterify the carboxyl groups with said epoxide groups and selecting the quantities of reactants such that the hydroxyl content of the polyester resin is at least 8% by weight thereof.

3,912,691
HYDROCURABLE COMPOSITIONS OF HYDROXY (POLYALKYLENECARBONYLOXY)-ALKYLENEOX-AZOLIDINE AND AN ISOCYANATE

William D. Emmons, Huntingdon Valley, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

Filed Dec. 14, 1973, Ser. No. 425,007
Int. Cl.² C08G *18/34, 18/38, 18/46*
U.S. Cl. 260—77.5 MA **14 Claims**

1. A composition comprising a compound of the following structural formula:



wherein R^1 is hydrogen, mononuclear aryl, aralkyl or alkyl; R^2 is hydrogen or alkyl or R^1 and R^2 are joined together with the carbon atom to which they are attached to form cycloalkyl; R^3 is hydrogen, alkyl, cycloalkyl, alkoxy or mononuclear aryl; R^1, R^2 and R^3 may be substituted with halo, lower alkoxy, hydroxy, amino or nitro; Y is unsubstituted or substituted lower alkylene; X is substituted or unsubstituted lower alkylene; *n* is an integer of at least 3, and z is an integer of 1–50 and a polyfunctional isocyanate.

3,912,692
PROCESS FOR POLYMERIZING A SUBSTANTIALLY PURE GLYCOLIDE COMPOSITION

Donald James Casey, Ridgefield, and Martin Epstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

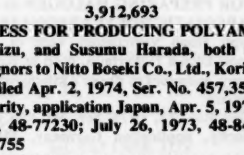
Continuation-in-part of Ser. No. 356,977, May 3, 1973, abandoned. This application Sept. 24, 1974, Ser. No. 508,778
Int. Cl.² C08G *63/08*
U.S. Cl. 260—78.3 R **7 Claims**

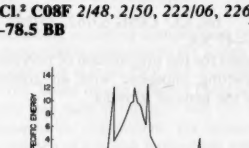
1. A process for polymerizing a glycolide comprising heating a mixture of a substantially pure glycolide composition, from about 0.01 to 0.15 mole percent based on the moles of said glycolide composition of inositol and from about 0.0001 mole percent to about 0.010 mole percent, based on the moles of said glycolide composition of a polymerization catalyst at a temperature between about 210°C. and 245°C. for a period of time varying inversely between about 120 minutes and 20 minutes.

3,912,693
PROCESS FOR PRODUCING POLYAMINES

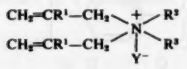
Kiyoshi Shimizu, and Susumu Harada, both of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Koriyama, Japan

Filed Apr. 2, 1974, Ser. No. 457,359
Claims priority, application Japan, Apr. 5, 1973, 48-38947; July 9, 1973, 48-77230; July 26, 1973, 48-84285; Oct. 4, 1973, 48-111755
Int. Cl.² C08F *2/48, 2/50, 222/06, 226/04*
U.S. Cl. 260—78.5 BB **27 Claims**





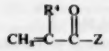
1. A process for producing a polymer or copolymer of diallylamine derivative of the formula,



(I)

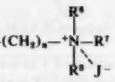
wherein R^1 is hydrogen or methyl; R^2 and R^3 are independently hydrogen, allyl, methallyl, straight-chain or branched-chain alkyl having 1–6 carbon atoms, phenylalkyl having 7–19 carbon atoms, or hydroxyalkyl of the formula, $HO-(CH_2)_m-$, in which *m* is an integer of 1–6 or R^2 and R^3 may form together with the adjacent N atom pyrrolidyl, piperidyl or morpholino; and Y is halogen or inorganic acid anion, which comprises (a) conducting photopolymerization of a solution or slurry comprising at least one diallylamine derivative of the formula (I) with or without maleic acid or maleic anhydride and a solvent or non-solvent in an amount of 30% by weight or less based on the total weight of the monomer or monomers with irradiation of light having wavelengths of 150–500 μ in

the presence or absence of a sensitizer, or (b) conducting photopolymerization of a solution or slurry comprising at least one diallylamine derivative of the formula (I), N-vinylpyrrolidone or at least one vinyl compound of the formula,



(II)

wherein R^4 is hydrogen or methyl; and Z is a group of the formula, $-OR^5$ (wherein R^5 is hydrogen, methyl, a group of the formula, $-(CH_2)_n-OH$ in which n is an integer of 1–5, or a group of the formula,



in which R^6, R^7 R^8 are independently hydrogen, alkyl having 1–3 carbon atoms or benzyl; J is halogen, and *n* is as defined above) or a group of the formula,

wherein R^9 and R^{10} are independently hydrogen, alkyl having 1–5 carbon atoms or a group of the formula, $-(CH_2)_p-OH$ in which p is an integer of 1–3, and a solvent or non-solvent in an amount of 30% by weight or less based on the total weight of the monomers with irradiation of light having wavelengths of 150–500 mμ in the presence of a charge-transfer complex of sulfur dioxide and a diallylamine derivative of the formula (I).

3,912,694

MECHANICAL DOLLS WHICH ARE CONTROLLED BY SIGNALS ON A RECORDING MEDIUM

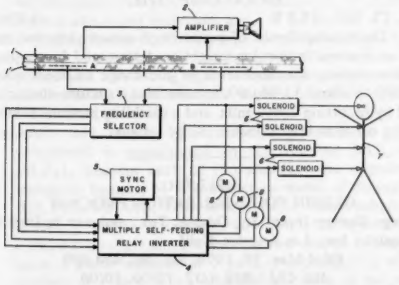
Jorge A. Chiappe, and Hercules C. A. B. Bianco, both of Gonet, Argentina, assignors to Loreto M. Dominguez, Washington, D.C., a part interest

Continuation-in-part of Ser. No. 335,173, Feb. 23, 1973, abandoned, which is a continuation of Ser. No. 166,555, July 27, 1971, abandoned. This application Feb. 5, 1974, Ser. No. 439,691

Claims priority, application Argentina, July 29, 1970, 182783

Int. Cl.² G11B *31/00*

U.S. Cl. 360—79 **4 Claims**



1. An apparatus for selectively controlling a plurality of solenoids of at least one solenoid operated mechanical figure, comprising:

a recording medium having a first track on which audio information is recorded and a second track on which frequency dependent control information is recorded in the form of a train of frequency modulated pulses including at least two sets of pulses of different frequencies;

means for reproducing said train of pulses from said recording medium;

control signal generating means coupled to said reproducing means and having a plurality of outputs corresponding in number to the number of different frequencies with which said pulse train is modulated, and comprising,

means to detect the frequency of each pulse of a pulse train reproduced from said recording medium, and

means to generate a control signal at an output of said control signal generating means which corresponds to the detected frequency of a reproduced pulse; and

means coupling the outputs of said control signal generating means to corresponding ones of said mechanical figure solenoids to selectively operate said solenoids by said detected control signals.

3,912,695

FIBROUS ARTICLES FROM PHENYLENE SULFIDE POLYMERS

James N. Short, Bartlesville, Okla.; Lee O. Edmonds, deceased, late of Bartlesville, Okla. (by Emmilou Edmonds, executrix), and James T. Edmonds, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 458,702, April 8, 1974, which is a continuation-in-part of Ser. No. 354,981, April 27, 1973, abandoned, which is a division of Ser. No. 237,881, March 24, 1972, abandoned. This application June 3, 1974, Ser. No. 475,767

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79 **11 Claims**

1. An article of manufacture comprising a yarn or fabric of melt-spun, high modulus, high-melting, non-burning phenylene sulfide polymer fibers formed from at least partially cured phenylene sulfide polymers having a melt flow within the range of 75 to 800 grams per 10 minutes as measured by ASTM method D-1238-70 modified to operate at 650°F with a piston load of 5 kilograms.

3,912,696

CURABLE PLASTIC COMPOSITION

John I. Doughty, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 23, 1962, Ser. No. 211,886

Int. Cl.² C08G *75/14*; C08K *3/22*, *3/24*

U.S. Cl. 260—79.1 **14 Claims**

10. A stable unitary liquid polymer composition protected from moisture and capable of being shipped and stored in a single container and later being deposited in place without agitation or intermixing with other material for complete curing by contact of its surface with surroundings containing essentially only moisture, said composition comprising essentially (a) a liquid polyalkylene polysulfide polymer having thoroughly dispersed therein, (b) a dormant curing agent in an amount sufficient to cure said polymer which is activated by the presence of moisture, and (c) an alkaline desiccating deliquescent accelerating agent adapted and sufficient to maintain said polymer in dry condition during shipment and storage and to attract and absorb moisture from its surroundings after deposition in place to hasten the curing of said polymer by said curing agent, wherein (b) and (c) are different substances and said accelerating agent is water-soluble and composed of at least one number of the group consisting of the alkaline earth metal oxides and hydroxides.

3,912,697
LIGHT-SENSITIVE POLYMERS

James G. Pacifici, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

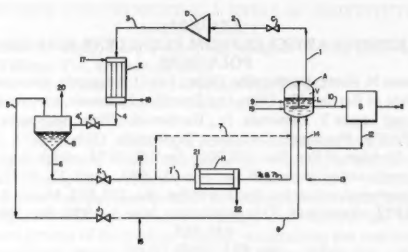
Filed Apr. 27, 1973, Ser. No. 355,117
Int. Cl.² C08F 28/00; G03C 1/68
U.S. Cl. 260—79.5 NV 26 Claims

1. A light-sensitive polymer which comprises a polymer having a light-sensitive moiety selected from the group consisting of styrylbenzimidazole, styrylbenzoxazole and styrylbenzothiazole attached to the polymer backbone.

3,912,698
ETHYLENE/α-OLEFIN COPOLYMERIZATION PROCESS

Edward Lytle Shurts, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 189,587, Oct. 15, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,614
Int. Cl.² C08F 2/06, 10/02, 36/20
U.S. Cl. 260—80.78 9 Claims



1. In the continuous process for preparing hydrocarbon-soluble copolymers with a coordination catalyst in a C_5–C_8 aliphatic hydrocarbon solvent in an evaporatively cooled reactor at about −20°C. to about 80°C. to a copolymer containing about 65–80 weight percent of the ethylene component, wherein ethylene and at least one C_5–C_7 alpha-olefin are introduced both as a vapor and as a liquid to the reactor, the vapor phase in the reactor having a propylene/ethylene mole ratio of less than about 2:1, and at least part of the reactor off-gas is condensed and the condensate partially vaporized substantially adiabatically to form a liquid/gas stream which is recycled to the reactor; the improvement of increasing the reactor capacity while avoiding reactor inlet fouling by maintaining the ethylene content of the reactor off-gas at about 25–75 mole percent, condensing in the above-recited condensation step at least about 25 mole percent of the reactor off-gas, and, following the above-recited substantially adiabatic vaporization step, heating and partially vaporizing the condensate to obtain a recycle liquid having less than about 20 mole percent ethylene.

3,912,699
IONOMER COMPOSITIONS

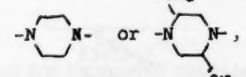
Edmund Arthur Flexman, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 17, 1974, Ser. No. 515,710
Int. Cl.² C08F 8/32, 222/02
U.S. Cl. 260—88.1 PC 16 Claims

1. An ionomer composition comprising a homogeneous, random, high molecular weight base resin copolymer compound of at least 50 mole percent copolymerized ethylene and complementally from about 5 to 25 mole percent of a copolymerized α, β-ethylenically unsaturated monocarboxylic acid, selected from the group consisting of acrylic acid and methacrylic acid, and from 0 to 25 mole percent of a copolymerized third monomer, selected from the group consisting of 1-olefins having from 3 to 10 carbon atoms, vinyl acetate, alkyl acrylates and alkyl methacrylates, in which from about 10 percent to 100 percent of the carboxylic acid groups have been neutralized by reaction with from 10 to about 300% of the stoichiometric proportion required for neutralization of the carboxylic acid groups in the base resin of a diamine having the structure

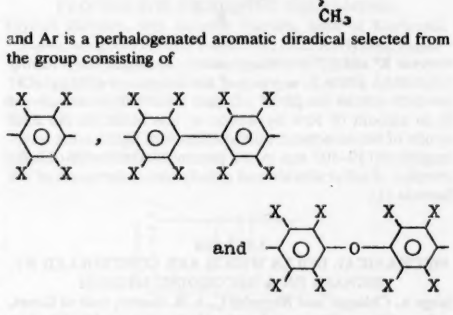
$$H—B—Ar—B\text{-}\left(\text{-}Ar—B\right)_y H$$

in which y is an integer from 0 to 1 inclusive, B is a diamine diradical selected from the group consisting of linear aliphatic diaminodiradicals of the structure $—NH—(CH_2)_n NH—$, where n is an integer from 2 to 12 inclusive, branched chain, aliphatic diamino diradicals of the structure



in which R is an alkyl radical of 1 to 6 carbon atoms, inclusive, p and q are integers from 1 to 10, inclusive, and the sum of $p+q$ is an integer from 2 to 11, inclusive, and piperazino diradicals of the structure

and Ar is a perhalogenated aromatic diradical selected from the group consisting of



in which X is a halogen radical selected form Cl— and Br—

3,912,700
PARA-T-BUTYL-α-METHYLSTYRENE POLYMERS

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 886,382, Dec. 18, 1969, Pat. No. 3,642,636. This application May 14, 1971, Ser. No. 143,595
Int. Cl.² C08F 112/12
U.S. Cl. 260—93.5 R 1 Claim

1. The homopolymer of para-t-butyl-α-methylstyrene having an average molecular weight as determined by standard light-scattering measurements in the range of from about 50,000 to about 1,000,000, a molecular structure characterized by recurring styryl units, and a solubility in mineral lubricating oil of at least about 0.1% by weight.

3,912,701
OLEFIN POLYMERIZATION PROCESS

George Harvey Dunn, Jr., Odessa, Tex., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 25, 1974, Ser. No. 454,509
Int. Cl.² C08F 4/52, 10/00, 10/06
U.S. Cl. 260—93.7 6 Claims

1. In a continuous process for the polymerization of an α-olefin feed substantially free of catalyst contaminants in the presence of a titanium trichloride catalyst activated by an organoaluminum compound in a molar ratio of organoaluminum compound to titanium chloride between about 1.5:1 and

about 150:1 in a reaction zone maintained at elevated pressure, wherein a slurry comprised of polymer and unreacted monomer is withdrawn from the reaction zone, and the slurry is flashed in a low pressure separation zone from which are separately withdrawn a vapor comprised of unreacted monomer and a polymer, the improvement which comprises: intimately contacting an α-olefin stream containing catalyst contaminants with at least a sufficient amount of organoaluminum compound to deactivate said catalyst contaminants and to provide said α-olefin feed substantially free of catalyst contaminants and passing said feed in the absence of catalyst directly to the reaction zone, compressing at least a portion of the vapor from the low pressure separation zone and introducing the titanium trichloride catalyst in the absence of organoaluminum compound with at least part of the compressed stream directly into the reaction zone.

3,912,702

2,4-DIMETHYL-3-METHYLENE-1,4-PENTADIENE

Roe Calvin Blume, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 404,790, Oct. 9, 1973, which is a division of Ser. No. 231,395, March 2, 1972, Pat. No. 3,806,551. This application Sept. 23, 1974, Ser. No. 508,665

Int. Cl.² C08F *36/04*, *136/04*

U.S. Cl. 260—94.2 **1 Claim**

1. A high molecular weight homo-polymer of 2,4-dimethyl-3-methylene-1,4-pentadiene.

3,912,703

MODIFICATION OF POLYMERS BY TREATMENT WITH OLEFINS

James N. Short, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 72,242, Sept. 14, 1970, abandoned. This application July 17, 1973, Ser. No. 380,015

Int. Cl.² C08C *4/00*, *2/00*

U.S. Cl. 260—94.7 R **33 Claims**

1. A process for increasing the weight-average molecular weight of a polymer capable of having said molecular weight thereof increased, said polymer characterized by an initial weight-average molecular weight of about 1,000 to 10,000,000, a substantially carbon backbone, and internal carbon-carbon unsaturation in said polymer backbone,

said process comprising contacting said polymer with a lower molecular weight olefin in the presence of a homogeneous olefin disproportionation catalyst under conditions of temperature, pressure, and contact time sufficient to cause said catalyst to react upon said polymer to increase the molecular weight thereof,

wherein said lower molecular weight olefin is a nontertiary nonconjugated acyclic mono- or poly-ene of 2 to 30 carbon atoms per molecule, and

said homogeneous olefin disproportionation catalyst comprises a nitrosyl-ligand-containing transition metal compound and a reducing agent wherein the molar ratio of said reducing agent:transition metal compound is about 0.1:1 to about 1.5:1,

wherein said nitrosyl-ligand-containing transition metal compound is represented by the formula $[(L)_a(L')_b M_c Z_d]_x$ wherein each of (L) and (L′) are organic or inorganic ligands; M is a transition metal of Group IB, IIIB, IVB, VB, VIB, VIIB, or the iron or cobalt subgroups of Group VIII; Z is halide or CN, SCN, OCN, or $SnCl_3$; *a* and *d* each represent a whole number of 0 to 6, *b* represents a whole number of 1 or 2, *c* represents a whole number of 1 to 4; *x* is a number indicative of the polymeric state of compound; the number of L, L′, and Z groups present is not greater than the number required for the metal to achieve the closed shell electronic configuration of the next higher atomic number inert gas; and wherein the (L) ligands are R_3Q, R_3QO, $R_3Q—QR_2.R_3NR^1$, O, S, CO, $R_3N—R^2—NR_3$, R—S—R, R^3 S, $[\pi—(CHR^4—CR^4—CH_2)]$, $R^5(CN)_k$, $R^5O—$, $R^5(COO—)_k$, $RCOR^6(COO—)_k$, $[(RCO)_2CH—]$, $(R_2NCSS—)$, unsubstituted and R^5 group-substituted pyridine, unsubstituted and R^5 group-substituted bypyridine, or unsubstituted and R group-substituted cyclopentadienyl radicals; (L′) ligands are NO or $[\pi—(CHR^4—CR^4—CH_2)]$ such that at least one L′ is NO; wherein R is an aromatic or saturated aliphatic radical, including radicals substituted with groups such as halo groups or alkoxy groups and the like, having up to 20 carbon atoms; R^1 is hydrogen or an R radical; R^2 is a divalent R radical; R^3 is a divalent saturated aliphatic or ethylenically unsaturated aliphatic radical having from 4 to 10 carbon atoms; R^4 is hydrogen or methyl radical; R^5 is an aromatic, saturated aliphatic, or ethylenically unsaturated aliphatic radical having up to 30 carbon atoms; R^6 is a divalent saturated aliphatic radical having from 1 to 10 carbon atoms; Q is phosphorus, arsenic, or antimony; and k is a whole number and is 1 or 2;

wherein said $[(L)_a(L')_bM_cZ_d]_x$ represents a product obtained by combining at least one transition metal compound with at least one ligand-forming material employing a molar ratio of said transition metal compound to ligand-forming material of about 0.1:1 to about 10:1;

said reducing agent comprises

1. R_eAlX_f;
2. a mixture of the compounds of (1);
3. a mixture of one or more of AlX_3 or R_eAlX_f compounds with one or more compounds having the formula $R_g{}^1M^1X_h$;
4. an $R_gM^1Y_h$ compound;
5. an AlX_3 compound; or
6. $M^2M^1H_j$ compound

wherein each R is an aromatic or saturated aliphatic hydrocarbon radical having up to 20 carbon atoms including alkoxy and halo derivatives thereof, preferably an alkyl radical having up to 10 carbon atoms; each R^1 is hydrogen or R; each X is a halogen; Y is halogen or hydrogen; each M^1 and M^2 is a metal of Group IA, IIA, IIB or IIIA; *e* is 1, 2, or 3; *f* is 0, 1 or 2, the sum of *e* and *f* being 3; *g* is 1, 2 or 3, *h* is 0, 1 or 2, the sum of *g* and *h* being equal to the valence of M^1, *j* is an integer such that *b* is equal to the sum of the valences of M^1 and M^2.

3,912,704

PROTEASE INHIBITOR FROM HORSE URINE

Kartar Singh, Beaconsfield, Canada, assignor to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 251,168, May 8, 1972, abandoned. This application May 13, 1974, Ser. No. 469,180

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **1 Claim**

1. A protease inhibitor isolated from clarified horse urine by the process sequence consisting essentially of

a. adjusting the pH of the clarified horse urine to within the range pH 4.5 to 6.0;

b. admixing the urine with 0.05 to 5.0 parts by weight of an absorbent selected from the class consisting of aluminum silicate clay, magnesium oxide, diatomaceous earth and kaolin;

c. separating the absorbent from the admixture;

d. eluting the inhibitor from the absorbent with from 2 to 20 parts by volume of an aqueous eluent selected from the class consisting of aqueous pyridine, aqueous dimethyl sulfoxide and dilute ammonia;

e. adjusting the pH of the eluate to within the range pH 1.0 to 3.0;

f. repeating process steps b, c and d;

g. dialyzing the eluate against water;

h. precipitating the inhibitor from the dialyzed eluate by addition of acetone, ethanol, or ammonium sulfate and separating the precipitate;

i. dissolving the precipitate in water or phosphate buffer of pH 5.0–7.5;
j. admixing the dissolved precipitate with a cellulose anionic exchanger previously equilibrated to a pH of 5–7;
k. separating the exchanger from the admixture;
l. eluting the inhibitor from the exchanger; and
m. precipitating the inhibitor from the eluate by addition of acetone, ethanol or ammonium sulfate and separating the precipitate inhibitor;

which protease inhibitor

a. has a molecular weight of 26,000–28,000 when determined by gel filtration; of approximately 17.000 when determined by polyacrylamide gel electrophoresis; and of about 20,400 when determined by ultracentrifugation;
b. has a maximum of u.v. light absorption at about 280 nm;
c. has an amino acid composition as determined by hydrolysis with 6N hydrochloric acid shown in the following table;

	Amino Acids, grams per 100 g. Protease Inhibitor		
Duration of Hydrolysis	24 Hours	48 Hours	72 Hours
Lysine	7.4	7.2	7.1
Histidine	1.0	1.0	0.9
Arginine	6.5	6.5	6.2
Cysteic Acid	—	—	—
Aspartic Acid	11.7	12.0	12.0
Methionine Sulfone	—	—	—
Threonine	4.2	4.3	4.4
Serine	4.2	4.3	4.4
Glutamic Acid	17.0	17.3	17.5
Proline	3.3	3.3	3.4
Glycine	7.8	8.0	8.0
Alanine	5.4	5.6	5.7
½ Cystine	—	—	—
Valine	2.5	2.5	2.6
Methionine	1.6	—	—
Isoleucine	4.0	4.1	4.2
Leucine	7.5	7.6	7.8
Tyrosine	7.8	7.9	7.1
Phenylalanine	8.1	8.4	8.6
Total gms.	100	100	100

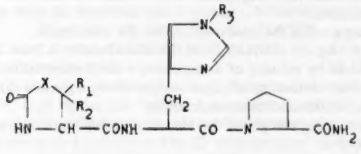
d. has an isoelectric point of 4.5–4.6;
e. is electrophoretically homegeneous;
f. stains with Ponceau S;
g. and one milligram of which inhibits about 3–4 milligrams of trypsin.

3,912,705
THYROTROPIN RELEASING HORMONE ANALOGS

Masahiko Fujino, Takarazuka; Tsunehiko Fukuda, Suita, and Chitoshi Hatanaka, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 7, 1974, Ser. No. 440,537
Claims priority, application Japan, Feb. 23, 1973, 48-22544
Int. Cl. C07c *103/52*; **C07g** *7/00*
U.S. Cl. 260—112.5 **4 Claims**

1. A compound of the formula



wherein all amino acid moieties are L-isomers and wherein
R_1 is hydrogen;
R_3 is hydrogen or methyl;
X is oxygen or sulfur;
when X is oxygen, R_2 is hydrogen or methyl; and
when X is sulfur, R_2 is hydrogen;
or its pharmaceutically acceptable acid salts.

3,912,706
LIGNIN COMPOSITION AND PROCESS FOR ITS PREPARATION

Donald G. Rachor, and Charles H. Ludwig, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Nov. 13, 1972, Ser. No. 305,922
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 R **22 Claims**

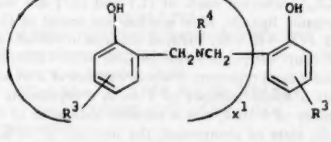
1. A process for the preparation of a water-soluble aminoalkylated lignin cross-linked with polyoxyalkylene linkages which comprises reacting a lignin having a phenolic hydroxyl content of at least 1.5 weight percent and a sulfonate sulfur content of less than 1⅛ times the phenolic hydroxyl content with a secondary alkylamine of from 2 to 8 carbon atoms having alkyl radicals of from 1 to 6 carbon atoms with an aldehyde selected from the group consisting of formaldehyde, benzaldehyde, and furfural to obtain an aminoalkylated lignin containing at least 1% organic nitrogen and cross-linking the aminoalkylated lignin with polyoxyalkylene linkages of from 120 to 1000 molecular weight by reacting the aminoalkylated lignin with a polyoxyalkylene sulfonate di-ester or polyoxyalkylene dihalide to the extent that from 30% to 80% of the phenolic hydroxyl content of the aminoalkylated lignin has been reacted, said polyoxyalkylene linkages having a molecular weight of from 120 to 1000 and repeating units of from 2 to 4 carbon atoms.

3,912,707
AMINE AND SULFUR-CONTAINING ALKYLPHENOXIDES

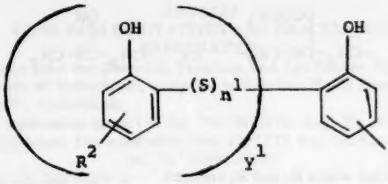
Andrew Doyle Abbott, Greenbrae, and Thomas V. Liston, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 186,494, Oct. 4, 1971, Pat. No. 3,741,896, which is a continuation-in-part of Ser. No. 97,300, Dec. 11, 1970, abandoned. This application Oct. 27, 1972, Ser. No. 301,697
Int. Cl. C07g *17/00*
U.S. Cl. 260—136 **8 Claims**

1. A reaction product of
1. a Mannich base of the formula:



wherein:
R^4 is an alkyl having from 1 to 3 carbon atoms,
R^3 is an alkyl having from 8 to 36 carbon atoms,
x^1 is an integer of from 1 to 19;
2. A sulfurized alkyl phenol of the formula:



wherein:

R^2 is an alkyl having from 8 to 36 carbon atoms,

n^1 is an integer of from 1 to 5; and

y^1 is an integer of from 1 to 9; and

3. An alkaline earth metal base wherein the alkaline earth metal is selected from the group consisting of calcium and barium;

wherein the reaction of said Mannich base with said sulfurized alkylphenol and said alkaline earth metal base is conducted at a temperature between about 125°C to about 200°C and in the presence of ethylene glycol which is removed from the reaction system upon completion of the reaction, and wherein the ratio over the entire reaction product of the equivalents of alkylphenol from the said Mannich base to equivalents of alkylphenol from the said sulfurized alkylphenol is from 0.2–5:1, the said alkaline earth metal base is used in an amount to provide a total of from 1 to about 1.75 equivalents of said alkaline earth metal base per equivalent of alkylphenol, and a solution of said reaction product at a concentration of 0.88 formal of calcium or barium in a 100 neutral oil has a viscosity of 210°F in the range of about 200 to 3,000 SUS.

3,912,708

BISCATIONIC PYRIDINIUM MONOAZO DYES USEFUL FOR DYEING ACID-MODIFIED NYLONS

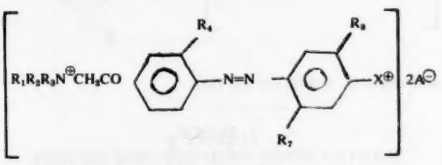
Daniel Shaw James, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 58,707, July 27, 1970, Pat. No. 3,759,893. This application May 3, 1973, Ser. No. 356,910

Int. Cl.² C09B *29/08*; D06P *3/26*

U.S. Cl. 260—156 **2 Claims**

1. A biscationic monoazo dye having the formula

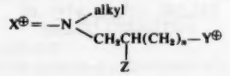


where R_1, R_2, and R_3 together with the adjacent nitrogen atom form pyridinium

R_4 = H or Cl

R_7 = H, alkyl, alkoxy, Cl, NHCO alkyl or $NHCOC_6H_5$

R_8 = H, Cl, alkyl or alkoxy



$Y^{\oplus} = N^{\oplus}R_9R_{10}R_{11}$ or $NHCOCH_2N^{\oplus}R_9R_{10}R_{11}$, where R_9 is alkyl or H, R_{10} is alkyl or hydroxyalkyl, R_{11} is alkyl, hydroxyalkyl or benzyl or R_{10} and R_{11} together with the adjacent nitrogen form piperidinium or pyrrolidinium

$n = 0$ or 1

Z = H when $n = 0$ and OH when $n = 1$

$A^{\ominus}$ = anion and where each alkyl, alkoxy and hydroxyaikyl contains 1 to 4 carbon atoms.

3,912,709

ZINC AND ZINC-CALCIUM SALTS OF PARTIAL ESTERS OF ROSIN

Charles Webster Gould, Shipley Heights, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 51,711, July 1, 1970, abandoned. This application July 3, 1974, Ser. No. 485,420

Int. Cl.² C09F *1/00*

U.S. Cl. 260—100 **4 Claims**

1. As a new composition of matter, a metal salt of a partial rosin ester selected from the group consisting of (1) a zinc salt of a partial rosin ester in which the combined zinc is, by weight, from about 6% to about 10.8% of the weight of the zinc salt and (2) a zinc-calcium salt of a partial rosin ester in which the combined zinc is, by weight, from about 3.1% to about 6.1% and the combined calcium is, by weight, from about 0.9% to about 2.1% based on the weight of the zinc-calcium salt, the said partial rosin ester being derived by reaction of rosin and an alcohol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, 1,2-propane diol, 1,3-propane diol and C_1–C_4 monohydric alcohols in amounts such that for each equivalent weight of rosin reactant there is employed from about 5% to about 60% equivalent weight of alcohol, said metal salt being essentially free of unreacted rosin acids.

3,912,710

ARYLAZO-IMINOISOINDOLINONE DYESTUFFS

Ernst Model, Basel; Jost von der Crone, and Andre Pugin, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

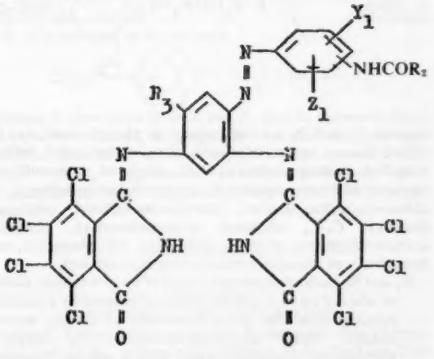
Filed Sept. 13, 1972, Ser. No. 288,620

Claims priority, application Switzerland, Sept. 27, 1971, 14053/71

Int. Cl.² C09B *43/00*

U.S. Cl. 260—165 **9 Claims**

1. An iminoisoindolinone dyestuff of the formula



wherein R_3 is H or methoxy and Y_1 and Z_1 denote hydrogen, chlorine, alkyl containing 1 to 4 carbon atoms for alkoxy containing 1 to 4 carbon atoms.

3,912,711
SYNTHETICALLY PRODUCED UNDECAPEPTIDE, SUBSTANCE P

Susan E. Leeman, 139 Park St., Newton, Mass. 02159; Michael Moon Ki Chang, 16619 Marquey Terrace, Pacific Palisades, Calif. 90272; Geoffrey W. Tregear, 42 Lawrence Road, Chestnut Hill, Mass. 02167, and Hugh D. Niall, University of Melbourne, Parkville, Victoria, Australia (03052)

Filed July 3, 1972, Ser. No. 268,679
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 **2 Claims**

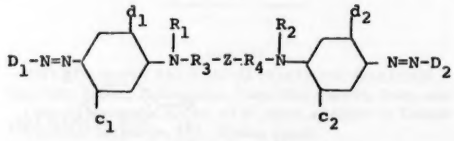
1. A synthetically produced undecapeptide, L-arginyl-L-prolyl-L-lysyl-L-prolyl-L-glutaminyl-L-glutaminyl-L-phenylalanyl-L-phenyalanyl-L-glycyl-L-leucyl-L-methionine amide, said undecapeptide having the same sialogogic function and arterial blood pressure lowering function when injected into mammals as naturally derived substance P.

3,912,712
DISAZO DYESTUFFS OF THE DISPERSE SERIES WHEREIN TWO AZOBENZENE MOLECULES ARE LINKED TOGETHER

Richard Peter, Basel, and Hans-Joerg Angliker, Reinach, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 133,698, April 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 693,703, Dec. 27, 1967, abandoned. This application Mar. 11, 1974, Ser. No. 449,877
Claims priority, application Switzerland, Jan. 4, 1967, 77/67; May 26, 1967, 7468/67; Dec. 11, 1967, 17307/67
Int. Cl.[2] C09B *33/06, 33/12, 43/12, 43/14*
U.S. Cl. 260—184 **5 Claims**

1. A disazo disperse dyestuff which is free from sulphonic acid groups, of the formula

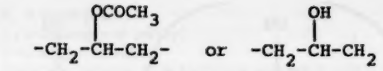


wherein D_1 and D_2 are each phenyl or phenyl substituted by chloro, bromo, cyano, thiocyano, nitro, methyl, ethyl, trifluoromethyl, methoxy, ethocy, C_1-C_2 alkylated aminosulfonyl, (hydroxyethyl)-aminosulfonyl, cyanoethylaminosulfonyl, β-chloroethylsulfonylamino, phenylaminosulfonyl, aminosulfonyloxy, C_1-C_4 alkylated aminosulfonyloxy, phenyl, acetylaminophenyl, phenoxy, phenylazo, nitrophenylazo, carbomethoxy or trimethylammoniummethylcarbonyl;

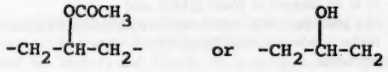
R_1 and R_2 each are hydrogen, alkyl of up to 4 carbon atoms, or alkyl of up to 4 carbon atoms substituted by a member selected from the group consisting of chloro, bromo, phenyl, C_1-C_4 alkylcarbonyloxy, C_1-C_4 alkylcarbonylamino, hydroxy, cyano, C_1-C_4 alkoxy, benzoyl, cyanoethoxy, C_1-C_4 alkylcarbamoyl, aminocarbonyl and C_2-C_4 alkyloxycarbonyloxy;

d_1, d_2, c_1 and c_2 each are hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio or phenoxy;

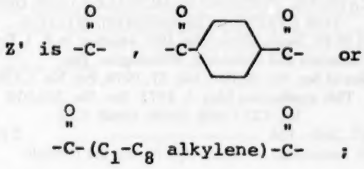
R_3 and R_4 are each alkylene of up to 3 carbon atoms,



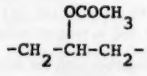
such that where R_3 and R_4 are each



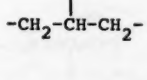
where R_5 is p-tolyl, p-methylcarbonylaminophenyl, phenyl or C_1-C_3 alkyl; or is -X'-Z'-X'-
where X' is —O— or —NH— and

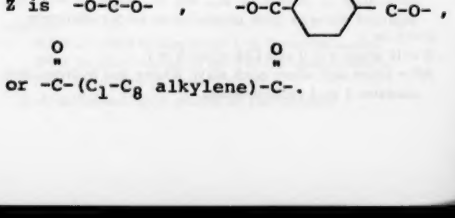


and where R_3 and R_4 are not each



or





3,912,713

GUAR GUM DERIVATIVES AND PROCESS FOR PREPARATION

Douwe Johannes Boonstra, Veendam, and Age Bakker, Haren, both of Netherlands, assignors to Scholten-Honig Research B.V., Netherlands

Continuation-in-part of Ser. No. 392,470, Aug. 29, 1973, abandoned. This application Nov. 12, 1973, Ser. No. 414,844

Int. Cl.² C08B *37/00*

U.S. Cl. 260—209 R **7 Claims**

1. In a method for producing derivatives of guar gum wherein guar gum is reacted with a monofunctional or polyfunctional etherifying agent or esterifying agent, the improvement which comprises employing the guar gum in the form of splits at a moisture content of 20–80% by weight, while maintaining the form of gum splits throughout the reaction, adjusting the moisture content of the thus obtained reacted splits to 30 to 80% by weight and fragmenting them by pressing them out in a thin layer and drying them on a cylinder heated to 100°–180°C to form a film, and comminuting said film to flakes of a size in the order of + 20 mesh.

3,912,714

N-METHYL-D-GLUCOSAMINE COMPLEX OF 4-METHYLURACIL, METHOD FOR PRODUCING AND USE THEREOF

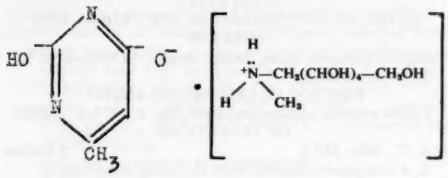
Valter Osvaldovich Kulbakh, Bukharestskaya ulitsa, 86, Korpus 1, kv. 85, and Inesa Vladimirovna Popova, Vasilievsky ostrov, 2 liniya, 25, kv. 27, both of Leningrad, U.S.S.R.

Filed Apr. 9, 1973, Ser. No. 349,670

Int. Cl.² C07H *5/06*

U.S. Cl. 260—211 R **5 Claims**

1. N-methyl-d-glucosamine complex of 4-methyluracil of the formula:



3,912,715

PROCESS FOR PREPARING NOVEL CATIONIC FLOCCULATING AGENTS AND PAPER MADE THEREWITH

Wadym Jarowenko, Plainfield, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 374,466, June 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 240,279, March 31, 1972, abandoned. This application June 20, 1974, Ser. No. 481,213

Int. Cl.² C08B *31/08*

U.S. Cl. 260—233.3 R **12 Claims**

1. A process for preparing a derivative of a water-dispersible polysaccharide comprising reacting said water-dispersible polysaccharide, colloidally dispersed in an alkaline aqueous medium, under alkaline conditions at a temperature between 25° and 160°C., and at a concentration sufficiently low to prevent the formation of agglomerates

with a non-polymeric derivatizing reagent having at least one cationic group and at least two functional groups reactive with said water-dispersible polysaccharide, said reagent being selected from the group consisting of

organic phosphonium, and sulfonium compounds having at least two functional groups reactive with polysaccharides,

amines containing at least tow non-halohydrin functional groups reactive with polysaccharides, said functional groups selected from the group consisting of chlorine atoms and activated double bonds,

cyclic amines having at least two functional groups reactive with polysaccharides,

condensation products of amine and polyamines with aldehydes and pplyaldehydes, and formaldehyde-acetone-amine condensates.

3,912,716

PROCESS FOR THE RECOVERY OF PURE HELLEBRIN

Otto Isaac, Bruchkobel, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed July 27, 1971, Ser. No. 166,595

Claims priority, application Germany, May 12, 1971, 2123535. The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² C07G *17/00;* **C07J** *19/00*

U.S. Cl. 260—236.5 **10 Claims**

1. In a process for the recovery of pure hellebrin from a hellebrin extract which has been preliminarily purified or enriched, the improvement consisting essentially of heating at a temperature up to reflux the extract containing not over 10% of water or of a solvent which does not cause precipitation upon heating with an oxygen containing solvent which is an alkanol having 1 to 8 carbon atoms, a cycloalkanol having 5 to 8 carbon atoms or a cyclic ether having 5 to 8 ring atoms including 1 to 2 ring oxygen atoms and the balance of the ring atoms being carbon atoms until the hellebrin first dissolves and continuing said heating until the hellebrin then crystallizes out of the solution without substantial loss of solvent whereby the precipitation as crystals is not caused by loss of solvent.

3,912,717

VINYLBENZYLTHIO- AND VINYLBENZYLDITHIO-CARBAMATES

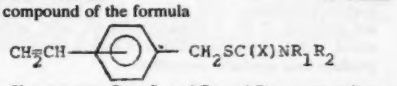
Thomas J. Giacobbe, Concord, Calif., and Elizabeth J. Norton, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1973, Ser. No. 356,529

Int. Cl.² C07C *153/09, 153/11;* **C07D** *207/04, 295/20*

U.S. Cl. 260—239 BF **10 Claims**

1. A compound of the formula



wherein X represents O or S, and R_1 and R_2 represent lower alkyl, lower alkenyl, or, together with the nitrogen, pyrrolidino, piperidino or hexamethyleneimino, provided that when NR_1R_2 represents hexamethyleneimino, di-2-propenylamino, butylethylamino or dipropylamino, X represents O.

3,912,718

BICYCLIC ACYL PENICILLINS

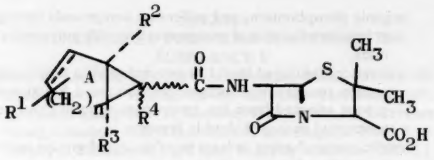
Daniel M. Teller, Devon, and John H. Sellstedt, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 22, 1973, Ser. No. 343,765

Int. Cl.² C07D *499/46, 499/44*

U.S. Cl. 260—239.1 **6 Claims**

1. A compound having the structure:



wherein R^1, R^2, R^3, and R^4 may be the same or different and are hydrogen or alkyl of from 1 to 6 carbon atoms; *n* is an integer of from 1 to 4; and the dashed line in Ring A indicates an optional double bond when *n* is 1.

3,912,719

PRODUCTION OF SEMISYNTHETIC PENICILLINS

Chester Sapino, Jr., East Syracuse; Albert Louis Vulcano, Liverpool; Steven Peter Brundidge, Wolcott, and James David Mahan, Syracuse, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,459

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **68 Claims**

1. In the process for producing a synthetic penicillin from a natural penicillin by the consecutive steps of

a. forming a solution in an anhydrous, unreactive organic solvent of a silyl ester of said natural penicillin in the presence of a weak tertiary amine,

b. adding at below 0° C. a halogenating agent to form a solution of the imino-halide,

c. mixing said solution at below −20° C. with alcohol to form a solution of the imino-ether,

d. mixing said solution with water to produce 6-aminopenicillanic acid in a biphasic system,

e. isolating said 6-aminopenicillanic acid as a solid,

f. redissolving it in a solvent and

g. adding thereto a carboxylic acid chloride as an acylating agent to produce said synthetic penicillin,

the improvment which comprises maintaining the imino-ether solution in the hydrolysis step at −50°C. while adding a volume of water no greater than 10% of the volume of the imino-ether solution to produce a single phase containing 6-aminopenicillanic acid which is then, without intermediate isolation of the 6-aminopenicillanic acid, acylated at about −40° C. after the addition of a weak tertiary amine to produce said synthetic penicillin.

3,912,720

β- KETOACYL DERIVATIVES OF 6-AMINOPENICILLANIC ACID AND PROCESS THEREOF

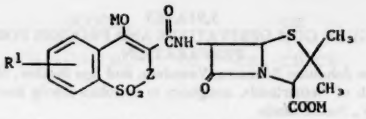
Jagadish C. Sircar, Dover; Harold Zinnes, Rockaway, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 464,707, April 26, 1974, Pat. No. 3,878,198. This application Nov. 14, 1974, Ser. No. 523,767

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **2 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, halogen, alkoxy of 1 to 7 carbon atoms, cyano or trifluoromethyl; Z is CHR_2; R_2 is hydrogen, alkyl of 1 to 7 carbons or aralkyl wherein the alkyl moiety contains from 1 to 7 carbon atoms and the aryl moiety is a monocyclic aromatic radical of 6 to 10 carbon atoms and M is alkali metal or alkaline earth metal.

3,912,721

METHOD FOR EXTRACTING LACTAMS FROM ACIDIC REACTION MIXTURES

Roberto Mattone, Seveso; Giancarlo Sioli, Como, and Luigi Giuffre, Milan, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed June 26, 1973, Ser. No. 373,799

Claims priority, application Italy, June 28, 1972, 26384/72

Int. Cl.² C07D *201/16*

U.S. Cl. 260—239.3 A **6 Claims**

1. A method for the extraction of caprolactam from reaction mixtures containing it, wherein the lactam is extracted with a liquid extraction medium, which is a phenol substituted by at least one alkyl substituent whose alkyl chain contains at least three carbon atoms, said substituent being capable of imparting lipophilic characteristics to the phenol and having a water solubility of less than 0.5 grams per 100 grams of water, and a solubility in sulfuric acid of less than 0.2 grams per 100 grams of 50% sulfuric acid.

3,912,722

NOVEL 6β-AMINO-STEROIDS AND PRODUCTION THEREOF

Fumikazu Mukawa, Mino, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 30, 1973, Ser. No. 420,460

Claims priority, application Japan, Dec. 6, 1972, 47-12265

Int. Cl.² C07J *100*

U.S. Cl. 260—239.5 **6 Claims**

1. A compound selected from the group consisting of 6β-propylamino-5α-cholestane-3β,5-diol, 6β-isopropylamino-5α-cholestane-3β,5-diol, 6β-isopropylamino-stigmast-22-en-3β,5-diol, 6β-isopropylamino-stigmastane-3β,5α-diol, 6β-piperidino-stigmast-22-en-3β,5α-diol, 6β-isopropylamino-5α-pregnan-3β,5-diol, 6β-isopropylamino-5α-androstane-3β,5-diol, 6β-adamantylamino-5α-cholestane-3β,5-diol, 6β-tert.-butylamino-5α-cholestane-3β,5-diol, 3β-acetoxy-6β-isopropylamino-cholestan-5α-ol, 3β-acetoxy-6β-isopropylamino-stigmast-22-en-5α-ol, and 3β-benzoyloxy-6β-isopropylamino-5α-cholestan-5-ol.

3,912,723

2-PHENYL-AS-TRIAZINE-3,5(2H,4H)DIONES

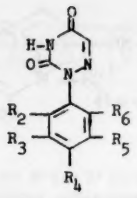
Max W. Miller, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 129,139, March 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 78,917, Oct. 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 768,191, Oct. 16, 1968, abandoned. This application July 20, 1973, Ser. No. 381,062

Int. Cl.² C07D *253/06*

U.S. Cl. 260—239.7 **21 Claims**

1. A compound having the formula



and the alkali metal and alkaline earth metal salts thereof wherein each of R_2 and R_6 is selected from the group consisting of hydrogen, fluoro, chloro, cyano and methyl; with the proviso that at least one of R_2 and R_6 is hydrogen or fluoro;

each of R_3, R_4 and R_5 is selected from the group consisting of a first sub-group consisting of hydrogen, cyano, trifluoromethyl, halogen and lower alkyl; a second sub-group consisting of lower alkoxy and lower alkylthio; a third sub-group consisting of nitro and thiocyanate; with the proviso that when at least one of R_3 and R_5 is selected from the second sub-group, R_4 is selected from the first and third sub-groups; and only one of R_3 and R_5 is hydrogen.

3,912,724
PREPARATION OF DISPERSE BISANIL DYES DERIVED FROM DIAMINOMALEONITRILE

Robert Walter Begland, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 3, 1974, Ser. No. 430,415
Int. Cl.² C09B *55/00*
U.S. Cl. 260—240 G **9 Claims**

1. Improved process of preparing the bisanil dye of the formula $Ar_1—CH=N—C(CN)=C(CN)—N=CH—Ar_2$ wherein each of Ar_1 and Ar_2 is independently selected from phenyl and naphthyl groups containing 0–3 substituents selected from NO_2, halogen, CN, C_{1-4} alkyl, C_{1-4} alkoxy, OCH_2-phenyl, phenyl, CF_3, OH, OC_{1-4}alkylene-$N(C_{1-4}$ alkyl$)_2$, C_{2-4} alkylene-Cl, $NHCONH_2$, NHCOA, $NHSO_2A$, SR_8, SO_2R_8, NHR_1, $NHCOC_{1-4}$ alkylene-B and $-NR_1R_2$ wherein:

a. R_1 is C_{1-4} alkyl or C_{2-4} alkylene-R_3;

b. $R_2$is C_{1-4} alkyl, C_{2-4} alkylene-R_4, or, if Ar_1 or Ar_2 is phenyl, C_3 alkylene attached to a phenyl position which is ortho to the position to which the nitrogen is attached;

c. R_3 is CN, halogen, OH, phenyl, C_{1-4} alkoxy, OC_{1-4} alkylene-CN, CO_2A, OCOA, OCONHA or CO_2C_{1-4} alkylene-OCOA;

d. R_4 is CN, halogen, OH, phenyl, OC_{1-4} alkylene-CN, CO_2A, OCOA, CO_2C_{1-4} alkylene-OCOA, SO_2A, phthalimido, succinimido, glutarimide, $OCOCH=CH_2$, $CH_2—CH(OCOA)CH_2OA$ or $CH_2CH(OCONHA)CH_2OA$:

e. A is C_{1-4} alkyl or R_8;

f. B is halogen, C_{1-4} alkoxy or R_8;

g. R_8 is phenyl containing 0–2 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halogen, NO_2, CN, C_{1-4} alkyl-CONH and NR_6R_7 wherein each of R_6 and R_7 is independently selected from H and C_{1-4} alkyl, with at least one of R_6 and R_7 being C_{1-4} alkyl; and

h. R_9 is C_{1-4} alkyl, C_2H_4OH, C_{5-6} cycloalkyl or R_8,

said bisanil dye being substantially free of imidazole impurities, which process comprises the steps:

1. condensing diaminomaleonitrile and the aromatic aldehyde Ar_1CHO to produce the monoanil $Ar_1—CH=N—C(CN)=C(CN)—NH_2$;

2. reducing the monoanil from step (1) to produce $Ar_1CH_2NH—C(CN)=C(CN)—NH_2$;

3. condensing the product from step (2) and the aromatic aldehyde Ar_2CHO, which aldehyde is the same as or different from the aldehyde of step (1), to produce the monoanil $Ar_1CH_2NH—C(CN)=C(CN)—N=CH—Ar_2$; and

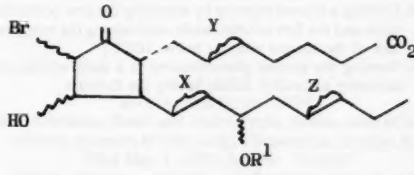
4. oxidizing the monoanil from step (3) with manganese dioxide, at ambient temperature, in the presence of a solvent selected from the group consisting of dimethylformamide, dimethylacetamide, dimethylsulfoxide, hexamethylphosphoramide and N-methylpyrrolidone to produce the bisanil dye $Ar_1—CH=N—C(CN)=C(CN)—N=CH—Ar_2$.

3,912,725
PROCESS FOR CONVERTING A TYPE PROSTAGLANDINS TO E TYPE PROSTAGLANDINS

Michael R. G. Leeming, Canterbury, England; Donald P. Strike, St. Davids, and Wen-Ling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 284,789, Aug. 30, 1972, Pat. No. 3,839,430. This application June 5, 1974, Ser. No. 476,757
Int. Cl.² C07D *309/06, 309/22;* **C07C** *69/02*
U.S. Cl. 260—240 R **3 Claims**

1. A compound of the formula:



in which R is hydrogen or alkyl of from 1 to about 6 carbon atoms, R^1 is 2-tetrahydropyranyl, or carboxylic acyl of from 1 to 6 carbon atoms, and

i. X, Y and Z are single bonds;

ii. X is a trans-double bond, Y and Z are single bonds;

iii. X is a trans-double bond; Y is a cis-double bond, Z is a single bond; or

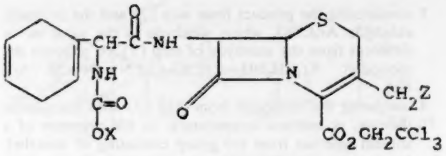
iv. X is a trans-double bond, Y and Z are cis-double bonds; with the proviso that the bromine and hydroxy ring substituents be in a trans stereochemical configuration.

3,912,726
PROCESS FOR THE PREPARATION OF 7-(D-2-AMINO-2-(1,4-CYCLO-HEXADIENYL) ACETAMIDO) DESACETOXYCEPHALOSPORANIC ACID AND 7-(D-2-AMINO-2-(1,4-CYCLOHEXADIENYL) ACETAMIDO) CEPHALOSPORANIC ACID

Patrick Andrew Diassi, Westfield, N.J., and Manmohan Singh Atwal, New York, N.Y., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 16, 1973, Ser. No. 333,096
Int. Cl.² C09D *501/20*
U.S. Cl. 260—243 C **7 Claims**

1. A compound of the formula:



wherein Z is selected from the group consisting of hydrogen and acetoxy and X is selected from the group consisting of trichloroethyl, t-butyl and hydrogen.

3,912,727
PREPARATION OF PHENOTHIAZINES

David A. Daniels, Kendall Park, N.J., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 308,890, Nov. 22, 1972, abandoned, which is a division of Ser. No. 152,372, June 11, 1971, abandoned. This application July 16, 1973, Ser. No. 379,834

Int. Cl.[2] C07D *279/36*

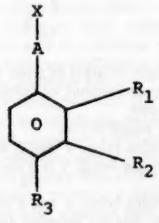
U.S. Cl. 260—243 A **13 Claims**

1. A process for replacing hydrogen attached to nitrogen in the 10 position of a first phenothiazine with an aralkyl group to form a second phenothiazine having the aralkyl group attached to the nitrogen in the 10 position, the process comprising the following sequential steps:

a. forming a first mixture by admixing dimethylsulfoxide and an alkali metal hydride while maintaining the temperature of the first mixture below 100°C;

b. forming a second mixture by admixing the first phenothiazine and the first mixture while maintaining the temperature of the second mixture below 100°C;

c. forming the second phenothiazine in a third mixture by admixing an aralkyl halide having the formula



in which (i) X is I, Br, or Cl; (ii) A is Cl_2, CBr_2, CCl_2, or an alkylene group having 1–7 carbon atoms; and (iii) R_1, R_2, and R_3 are separately selected from the group consisting of CH_3, C_2H_5, iodine, bromine, chlorine, fluorine, nitro, and hydrogen with the second mixture while maintaining the temperature of the third mixture below 100°C; and

d. separating and recovering the second phenothiazine.

3,912,728
7-(3-SUBSTITUTED UREIDO AND -THIOUREIDO) CEPHALOSPORINS

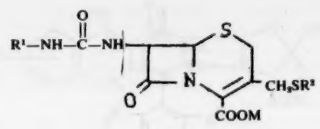
Pierre Crooij, Genval, and Alain Colinet, La Hulpe, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Belgium

Continuation-in-part of Ser. No. 265,371, June 22, 1972, abandoned. This application May 17, 1973, Ser. No. 361,393

Int. Cl.[2] C07D *501/24*

U.S. Cl. 260—243 C **6 Claims**

1. A compound of the formula:



wherein

R^1 is benzyl, said benzyl being unsubstituted or substituted with one or two halogen, hydroxy, methoxy, methyl, nitro, acetamido, amino or methylthio groups;

R^2 is a 5 or 6-membered heterocyclic group containing carbon and one or more N, O, or S atoms, said group being unsubstituted or substituted with one or two lower alkyl groups of 1 to 4 carbon atoms; and

M is hydrogen or an alkali metal cation.

3,912,729
OXAZINOINDOLE- AND THIAZINOINDOLE DERIVATIVES

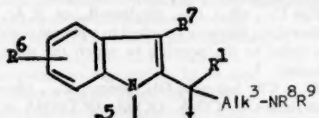
Christopher A. Demerson; Leslie G. Humber; George Santroch; Thomas A. Dobson, and Ivo Jirkovsky, all of Montreal, Canada, assignors to Ayerst, McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 226,287, Feb. 14, 1972, Pat. No. 3,833,575. This application June 19, 1974, Ser. No. 480,999

Int. Cl.[2] C07D *279/14, 265/28*

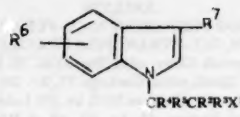
U.S. Cl. 260—243 R **22 Claims**

1. A process for preparing a compound of formula I



I.

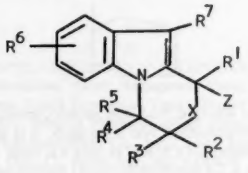
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen or lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl; X is oxy or thio; Alk^3 is CH_2 or Alk^1—CH_2 wherein Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are hydrogen or lower alkyl; and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-piperazinyl, which comprises treating a compound of formula III



III

in which R^2, R^3, R^4, R^5, R^6 and R^7 are as defined herein and X^1 is hydroxy or mercapto, with a compound of formula

in which R^1 is lower alkyl or lower cycloalkyl and Z is $CONR^8R^9$ or $Alk^1—CONR^8R^9$ wherein Alk^1, R^8 and R^9 are as defined herein, in the presence of a Friedel-Crafts catalyst, to obtain a compound of formula V



V

in which R^1, R^2, R^3, R^4, R^5, R^6, R^7, Z and X are as defined herein, and subjecting the compound of formula V to reduction with a suitable complex metal hydride selected from the group consisting of lithium aluminum hydride, lithium aluminum hydride-aluminum chloride, aluminum hydride-aluminum chloride, diborane and sodium borohydride-aluminum chloride, to give the compound of formula I.

3,912,730

2,4,6-TRIOXO-TETRAHYDRO-1,3-OXAZINES

Klaus Grohe, Odenthal-Erberich, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

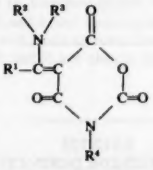
Filed Mar. 1, 1974, Ser. No. 447,406

Claims priority, application Germany, Mar. 9, 1973, 2311708

Int. Cl.² C07D *265/00, 273/00, 295/00;* **A01N** *9/00*

U.S. Cl. 260—244 **6 Claims**

1. 2,4,6-trioxo-tetrahydro-1,3-oxazine having the formula



wherein:

R^1 is methyl or phenyl;

R^2 and R^3, which may be the same or different, each is selected from the group consisting of hydrogen, alkyl containing 1 to 4 C-atoms, benzyl, cyclohexyl and phenyl which may be optionally substituted by alkoxy or alkyl each with 1 or 2 C-atoms; and

R^4 is selected from the group consisting of C_1 to C_4 alkyl, cyclohexyl, benzyl, and phenyl.

3,912,731

N-SUBSTITUTED ANTHRANILIC ANHYDRIDES

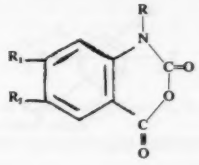
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz Inc., East Hanover, N.J.

Division of Ser. No. 337,381, March 2, 1973, Pat. No. 3,833,588, which is a continuation-in-part of Ser. No. 247,435, April 25, 1972, abandoned. This application May 20, 1974, Ser. No. 471,317

Int. Cl.² C07D *87/00*

U.S. Cl. 260—244 A **5 Claims**

1. A compound of the formula:



wherein

R is alkenyl of 3 to 10 carbon atoms, alkynyl of 3 to 6 carbon atoms or cyanoalkyl of 2 to 6 carbon atoms, and each of R_1 and R_2 is independently hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or both are alkoxy of 1 or 2 carbon atoms; or one is hydrogen and the other alkoxy of 1 or 2 carbon atoms.

3,912,732

DIOXAZINE DYESTUFFS

Kurt Burdeska, Basel, and André Pugin, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

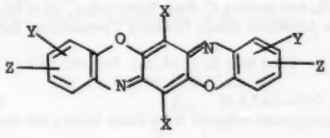
Filed May 1, 1973, Ser. No. 356,232

Claims priority, application Switzerland, May 9, 1972, 6872/72

Int. Cl.² C09B *19/02*

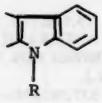
U.S. Cl. 260—246 R **4 Claims**

1. A dioxazine dyestuff of the formula



wherein

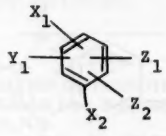
Y and Z denote hydrogen; halogen; nitro; nitrile; carbamoyl; lower alkyl; lower alkoxy; lower alkylmercapto; lower alkylsulphonyl; lower alkanoyl; lower alkanoylamino; lower alkoxycarbanoyl; lower alkylcarbamoyl; lower alkylsulphamoyl; phenoxy; phenoxy substituted by one or two radicals selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkanoyl, phenyl, or phenoxy; phenyl; benzoyl; benzoylamino; benzoylamino substituted by one or two radicals selected from the group consisting of halogen, lower alkyl, lower alkoxy, or lower alkoxycarbanoyl; phenylcarbamoyl; phenylsulphamoyl; phenylamino; phenylamino substituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, or lower alkoxycarbonyl; or wherein the radicals Y and Z form an indole ring with the group to which they are attached of the formula



wherein

R is hydrogen; or lower alkyl;

X is lower alkoxy; lower alkylmercapto; or a radical of the formula



wherein

X_1 denotes H; halogen; lower alkyl; lower alkoxy; lower alkanoyl; lower alkoxycarbonyl; trifluoromethyl; carboxylic acid amide; carboxylic acid amide substituted by one or two radicals selected from the group consisting of lower alkyl, or phenyl; phenoxy; benzoyl; or benzoyl substituted by one or two radicals selected from the group consisting of halogen, lower alkyl, or lower alkoxy;

Y_1 and Z_1 denote H; halogen; lower alkyl; or lower alkoxy; Z_2 denotes H; or halogen; and

X_2 denotes oxygen; or sulphur.

3,912,733

1-SUBSTITUTED -6-(2-HYDROXY-3-SUBSTITUTED AMINOPROPOXY)XANTHEN-9-ONES

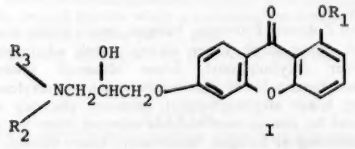
Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,053

Int. Cl.² C07D *295/00, 311/86*

U.S. Cl. 260—247.5 H **9 Claims**

1. A compound selected from those having the formula



I

where R_1 is hydrogen or lower alkylamino(lower)alkyl; and R_2 and R_3 when taken separately are hydrogen or lower alkyl and when taken together with the nitrogen atom to which they are attached are morpholino, piperazino, N-lower alkyl-piperazino, piperidino, lower alkylpiperidino and phen(lower)alkyl piperidino, and their pharmaceutically acceptable addition salt.

3,912,734

METHOD FOR PREPARING N_1-(2'-FURANIDYL)-AND N_1-2(2'-PYRANIDYL) URACILS

Solomon Aronovich Giller, ulitsa Pernavas, 10, kv. 76; Regina Abramovna Zhuk, ultisa Gorkogo 77, kv. 20; Anna Eduardovna Berzin, ulitsa Raunas 35/2, kv. 29; Laima Avgustovna Sherin, ulitsa Raunas 43, kv. 43, all of Riga, and Arvid Avgustovich Lazdinsh, ulitsa Mendeleeva 1, kv. 31, Olaine, all of U.S.S.R.

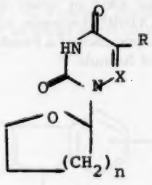
Filed June 1, 1973, Ser. No. 366,215

Claims priority, application U.S.S.R., Nov. 20, 1972, 1848519

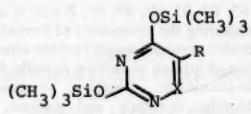
Int. Cl. C07d *55/10, 51/36*

U.S. Cl. 260—248 AS **4 Claims**

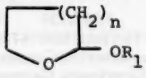
1. A method for the production of a compound of the formula



where R is selected from the group consisting of hydrogen, methyl, trihalomethyl, and a halogen, X is selected from the group consisting of CH and N, and *n* is from 1 to 2, consisting in reacting a 2,4-bis(trimethylsilyl) derivative of a uracil having the formula



where R is selected from the group consisting of hydrogen, methyl, trihalomethyl, and a halogen, X is selected from the group consisting of CH and N, with a 2-substituted cyclic ether having the formula



where R_1 is selected from the group consisting of acetyl and alkyl, and *n* is from 1 to 2, in the presence of a Friedel-Crafts catalyst in a medium of an organic solvent inactive with respect to the said starting components.

3,912,735

DICARBOXIMIDE DERIVATIVES

Brigitta Von Bredow, Binningen, and Hans U. Brechbuhler, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

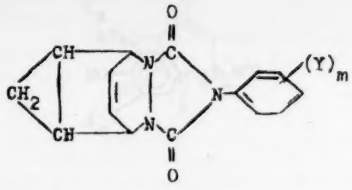
Filed Aug. 29, 1973, Ser. No. 392,830

Claims priority, application Switzerland, Sept. 1, 1972, 12923/72; Aug. 2, 1973, 11300/73

Int. Cl.³ C07D *237/26*

U.S. Cl. 260—250 AC **4 Claims**

1. A compound of the formula



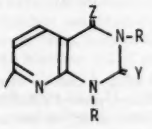
wherein Y represents chlorine, or trifluoromethyl, and *m* is a number from 1 to 3 with the proviso that only one Y is trifluoromethyl.

3,912,736
PYRIDO[2,3-D]PYRIMIDINE-THIONES

Kanji Noda, Chikushino; Akira Nakagawa, Tosu; Toshiharu Motomura, Tosu; Kenji Yamagata, Tosu; Shunzo Yamasaki, and Hiroyuki Ide, both of Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

Filed Oct. 17, 1974, Ser. No. 515,678
Claims priority, application Japan, Oct. 25, 1973, 48-120981
Int. Cl.² C07D *239/00*
U.S. Cl. 260—256.5 R **27 Claims**

1. A compound of the formula



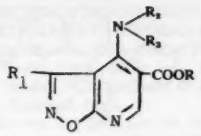
wherein R is selected from the group consisting of phenyl, halophenyl, dihalophenyl, tolyl and trifluoromethylphenyl; R^1 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl having from 3 to 5 carbon atoms, propargyl, cyclopropylmethyl, trihaloalkyl having from 1 to 3 carbon atoms, vinyloxyethyl, acetoxyethyl, ethoxyethyl and lower hydroxyalkyl having from 2 to 3 carbon atoms; Y and Z are selected from the group consisting of O and S, but Y and Z are always dissimilar.

3,912,737
ISOXAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Nurnberg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 129,199, March 29, 1971, Pat. No. 3,736,326. This application Mar. 5, 1973, Ser. No. 337,812
Int. Cl.² C07D *295/12*
U.S. Cl. 260—268 BC **8 Claims**

1. A compound of the formula



wherein R and R_1 each is hydrogen or lower alkyl,

is R_6-piperidino or R_6-piperazinyl and R_6 is hydrogen, lower alkyl or hydroxy-lower alkyl,
and physiologically acceptable acid addition salts thereof.

3,912,738
ISOMERS OF N,N'-BIS-[(1-FORMAMIDO-2,2,2-TRICHLORO)-ETHYL]-IPERAZINE AND METHOD OF ISOLATING THE SAME

Walter Ost, Bingen; Klaus Thomas, Gau-Algesheim; Ekkehard Amadori, Darmstadt-Arheilgen, and Rolf Darskus, Gau-Algesheim, all of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Filed Feb. 11, 1974, Ser. No. 441,010
Claims priority, application Germany, Feb. 10, 1973, 2306623; Oct. 15, 1973, 2351707; Dec. 21, 1973, 2363729
Int. Cl.² C07D *295/12*
U.S. Cl. 260—268 R **5 Claims**

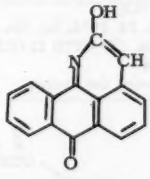
1. Racemic triforine or a mixture thereof with meso-triforine, said mixture consisting of at least 60% by weight of racemic triforine and the balance meso-triforine.

3,912,739
AZA-HYDROXY-BENZANTHRONE

Gioacchino Boffa, and Gian Paolo Chiusoli, both of Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Mar. 5, 1970, Ser. No. 16,989
Claims priority, application Italy, Mar. 7, 1969, 13784/69
Int. Cl.² C09B *5/14*
U.S. Cl. 260—278 **4 Claims**

1. 1-Aza-2-hydroxy-benzathrone of the formula

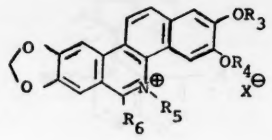


3,912,740
METHOD FOR THE PREPARATION OF OXYGENATED BENZO[C]PHENANTHRIDINE COMPOUNDS

Kwang Yuen Zee-Cheng, and Chia-Chung Cheng, both of Kansas City, Mo., assignors to The United States of America as represented by the Secretary of the Department of Health, Education, and Welfare, Washington, D.C.

Filed Feb. 28, 1974, Ser. No. 446,896
Int. Cl.² C07D *215/58*
U.S. Cl. 260—286 Q **8 Claims**

7. Allonitidine compounds of the formula



wherein R_3 and R_4 are selected independently from the group consisting of C_1–C_6 alkyl, R_5 is selected from the group consisting of C_1–C_6 alkyl, R_6 is selected from the group consisting of H— and C_1–C_6 alkoxy, and X is an anion selected from the group consisting of chloride, bromide, iodide, hydroxide, methosulfate, and the monovalent equivalent of polyvalent anions such as sulfate and phosphate.

3,912,741
1-(BENZO[B]THIENYLALKYL)PIPERIDINES

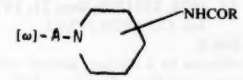
John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

Continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,028

Int. Cl.² C07D *211/58*

U.S. Cl. 260—293.57 **2 Claims**

1. A benzthienyl compound of the formula:



(I)

in which W represents benzo[b]thienyl, A represents a lower alkylene radical of 1 to 4 carbon atoms, R represents a radical selected from cyclohexyl, phenyl and phenyl substituted by lower alkyl, halogen, lower alkoxy or trifluoromethyl or a pharmaceutically acceptable acid addition salt thereof.

3,912,742
ACYLATED DERIVATIVES OF 2,6-DIHYDROXY-9-AZABICYCLO [3.3.1]NONANE

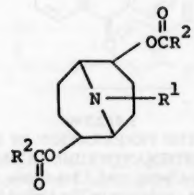
John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,421

Int. Cl.² C07D *221/22*

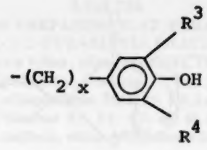
U.S. Cl. 260—293.54 **14 Claims**

1. A compound having the formula



wherein

R^1 is hydrogen, alkyl having 1 to 12 carbons and benzyl, and R^2 is alkyl having 1 to 24 carbons, benzyl, or a hindered phenolic group having the formula



wherein

R^3 and R^4 are lower alkyl having 1 to 8 carbons and x is an integer of 0 to 2.

3,912,743
4-PHENYLPIPERIDINE COMPOUNDS

Jorgen Anders Christensen, Virum, and Richard Felt Squires, Gl. Olstykke, both of Denmark, assignors to A/S Ferrosan, Denmark

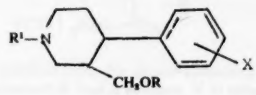
Filed Jan. 21, 1974, Ser. No. 435,006

Claims priority, application United Kingdom, Jan. 30, 1973, 4496/73

Int. Cl.² C07D *211/22*

U.S. Cl. 260—293.58 **8 Claims**

1. A 3-substituted 4-phenylpiperidine of the formula



(I)

wherein:

R represents alkyl of 1–4 carbon atoms; alkynyl of 2–4 carbon atoms; phenyl; phenyl substituted by alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, alkylthio of one to four carbon atoms, halogen, nitro, acetylamino, methylsulfonyl, or by methylenedioxo; or tetrahydronaphthyl;

R^1 represents hydrogen; alkyl of 1–4 carbon atoms; alkynyl of 2–4 carbon atoms; or 2,2,2-trifluoroethyl;

X represents hydrogen; alkyl or 1–4 carbon atoms; trifluoromethyl; methoxy; halogen; hydroxy; methylthio; or benzyloxy;

and a salt thereof with a pharmaceutically acceptable acid.

3,912,744
HYDROXY-PYRID ONE-MONOSULFONIC ACIDS

Ernst Heinrich, Frankfurt am Main-Fechenheim, and Rolf Müller, Frankfurt am Main, both of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

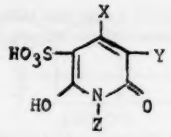
Division of Ser. No. 241,845, April 6, 1972, Pat. No. 3,867,392. This application July 5, 1974, Ser. No. 485,919

Claims priority, application Germany, Apr. 10, 1971, 2117753

Int. Cl.² C07D *213/52*

U.S. Cl. 260—294.8 R **4 Claims**

1. Hydroxy-pyridone-monosulfonic acids of the formula



and the tautomers thereof wherein X is alkyl having one to six carbon atoms; substituted alkyl wherein the alkyl moiety has from one to six carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl or substituted cyclohexyl wherein said cyclohexyl substituent is selected from the group consisting of chloro, methyl and methoxy; Y is hydrogen; alkyl having one to six carbon atoms; substituted alkyl wherein the alkyl moiety has from one to six carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy cyclohexyl; substituted cyclohexyl wherein said substituent is selected from the group consisting of chloro, methyl and methoxy or —COR wherein R is methoxymethyl, cyclohexyl or alkyl having one to two carbon atoms and Z is substituted alkyl wherein the alkyl moiety has from one to six carbon atoms and said substituent is selected from the group consisting of amino, methylamino, dimethylamino and

amino; monoalkylamino having one to four carbon atoms or dialkylamino having one to four carbon atoms in each alkyl moiety.

3,912,745

HYDROXY-PYRIDONE-MONOSULFONIC ACIDS

Ernst Heinrich, Frankfurt am Main-Fechenheim, and Rolf Muller, Frankfurt am Main, both of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

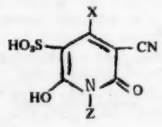
Division of Ser. No. 241,845, April 6, 1972, Pat. No. 3,867,392. This application Oct. 21, 1974, Ser. No. 516,768

Claims priority, application Germany, Apr. 10, 1971, 2117753

Int. Cl.² C07D *213/83*

U.S. Cl. 260—294.8 R **5 Claims**

1. Hydroxy-pyridone-monosulfonic acids of the formula



and the tautomers thereof wherein X is alkyl having 1 to 6 carbon atoms; substituted alkyl wherein the alkyl moiety has from 1 to 6 carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl or substituted cyclohexyl wherein said cyclohexyl substituent is selected from the group consisting of chloro, methyl and methoxy and Z is hydrogen; alkyl having 1 to 6 carbon atoms; substituted alkyl wherein the alkyl moiety has from 1 to 6 carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl or substituted cyclohexyl wherein the substituent is selected from the group consisting of chloro, methyl and methoxy.

3,912,746

SUBSTITUTED NITROGEN CONTAINING HETEROETHYLENEINDOLES

John Frank Poletto, Nanuet, N.Y.; George Rodger Allen, Old Tappan, N.J.; Ruddy Littell, River Vale, N.J., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 221,759, Jan. 28, 1972, Pat. No. 3,801,594, which is a continuation-in-part of Ser. No. 68,005, Aug. 28, 1970, Pat. No. 3,686,213, which is a continuation-in-part of Ser. No. 1,045, Jan. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 603,772, Dec. 22, 1966, abandoned. This application Nov. 1, 1973, Ser. No. 412,022

Int. Cl.² C07D *211/68*

U.S. Cl. 260—296 B **3 Claims**

1. The compound 1-[β-(2,6-dimethyl-5-methoxy-3-indolyl-)ethyl]-3-pyrroline.

2. The compound 1-[β-(2,7-dimethyl-5-methoxy-3-indolyl-)ethyl]-3-pyrroline.

3. The compound 1-[β-(2,7-dimethyl-5-methoxy-3-indolyl-)ethyl]-3-homopyrroline.

3,912,747

DERIVATIVES OF 2-HYDROXYMETHYL-1,3,4-OXADIAZOLE

Gérard J. Huguet; Claude P. Fauran; Colette A. Douzon; Guy M. Raynaud, all of Paris, and Janine M. Thomas, Neuilly sur Seine, all of France, assignors to Delalande S.A., Courbevoie, France

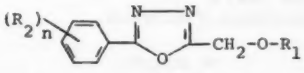
Filed Jan. 25, 1974, Ser. No. 436,694

Claims priority, application France, Feb. 1, 1973, 73.03593

Int. Cl.² C07D *271/10*

U.S. Cl. 260—307 G **19 Claims**

1. A compound of the formula:



wherein:

R_1 is hydrogen, aminocarbonyl or aminocarbonyl N-substituted by alkyl having up to 4 carbon atoms,

R_2 is halogen, alkoxy having up to 4 carbon atoms, alkyl having up to 4 carbon atoms, or trifluoromethyl, and

n is 0, 1, 2 or 3.

3,912,748

BENZOXAZOLE DERIVATIVES

Delme Evans, Chalfont St. Peter; David William Dunwell, Camberley, and Terence Alan Hicks, Farnborough, all of England, assignors to Lilly Industries Limited, London, England

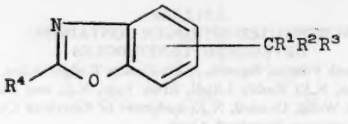
Filed May 1, 1973, Ser. No. 356,251

Claims priority, application United Kingdom, May 18, 1972, 23409/72

Int. Cl.² C07D *263/56*

U.S. Cl. 260—307 D **7 Claims**

1. Compound of the formula:



I

wherein the group —$CR^1R^2R^3$ is in the 5- or 6-position of the benzoxazole nucleus, wherein R^4 is cyclohexyl, furyl, thienyl, pyridyl, phenyl or phenyl substituted in any available position by one or two substituents selected from halogen, nitro, amino, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-3} alkyl-CO, C_{1-4} alkyl sulphonyl or substituted in two adjacent positions by methylene- or ethylene-dioxy, R^1 and R^2 are independently hydrogen, methyl or ethyl and R^3 is:

(i) the group —$COOR^5$, where R^5 is C_{1-4} alkyl; or

(ii) the group —CO—R^6 where R^6 is —NHOH or —NR^7R^8 where R^7 and R^8 are hydrogen; or

iii. the group —CH_2OR^9 where R^9 is hydrogen or C_{1-4} alkyl; or

iv. the group —COOH or an alkali or alkaline earth metal, aluminum or ammonium salt thereof.

3,912,749
CERTAIN N-THIO DERIVATIVES OF THIAZOLIDINONES

Stanley Ashton; Gwilym Thomas Jones; Vijay Ratna Sharma and John Anthony Taylor, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 30, 1973, Ser. No. 383,550

Claims priority, application United Kingdom, Aug. 18, 1972, 38620/72

Int. Cl.² C07D 277/04

U.S. Cl. 260—306.7 R **3 Claims**

1. A thiazolidinone of the formula:

(I)

wherein R is isopropyl, sec-butyl, or cyclohexyl, R^1 and R^2 are hydrogen, alkyl containing from one to four carbon atoms, phenyl, tolyl, methoxyphenyl, or chlorophenyl, or together are pentamethylene, and R^3 is hydrogen or methyl.

3,912,750
INTERMEDIATES FOR PRODUCING SEMI-SYNTHETIC PENICILLINS

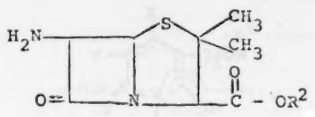
John H. Sellstedt, Pottstown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 197,142, Nov. 9, 1971, Pat. No. 3,859,298. This application Feb. 11, 1974, Ser. No. 441,593

Int. Cl. C07d 99/16, 99/24

U.S. Cl. 260—306.7 E **3 Claims**

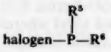
1. A method which comprises reacting a compound of the formula:



I

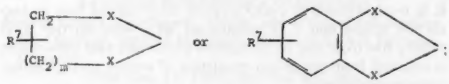
wherein:

R^2 is selected from the class consisting of hydrogen, alkali metal and tertiary amine; with a phosphorylating agent of the formula:



wherein:

R^5 and R^6 are each selected from the class consisting of (lower) alkyl, phenyl, naphthyl, phenyl(lower)alkyl and naphthyl(lower)alkyl; R^5 and R^6 joined together with the phosphorus atom form the ring



wherein:

x is selected from the class consisting of oxygen, methylene and sulfur; *m* is an interger from 1 to 6; and R^7 is selected from the class consisting of hydrogen and lower alkyl, said reaction being carried out in the presence of an acid binding agent.

3,912,751
6-AMINOPENICILLANIC ACID DERIVATIVES, METHODS FOR PRODUCING AND COMPOSITIONS CONTAINING SAME

Frantz Johannes Lund, Lyngby, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

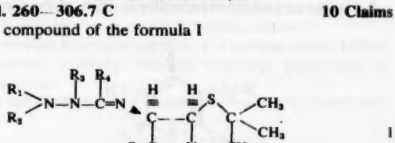
Filed Feb. 19, 1974, Ser. No. 443,191

Claims priority, application United Kingdom, Feb. 27, 1973, 9592/73

Int. Cl.² C07D 499/02

U.S. Cl. 260—306.7 C **10 Claims**

1. A compound of the formula I



I

in which R_1, R_2 and R_3 each represents a lower alkyl radical optionally being substituted with phenyl, a lower alkenyl radical, an acetyl, phenylacetyl or a carbamyl radical; R_2 further being represented by hydrogen in case that R_1 stands for acetyl or phenylacetyl; eacah of the radicals R_1 to R_4 also can together with one or more of the other radicals and any nitrogen atoms to which they are attached represent a ring system selected from the group consisting of pyrazolinyl, pyrazolidinyl,1,2,3,6-tetrahydropyridazinyl, 1,4,5,6-tetrahydropyridazinyl, hexahydropyridazinyl, piperidyl, morpholinyl, hexahydro-1H-azepin-lyl and hexahydro-1(2H)-azocinyl; R_4 represents hydrogen, methyl optionally substituted with phenyl or phenoxy, a phenyl radical optionally being chloro substituted, and a thienyl radical; R_5 represents hydrogen or lower alkyl or

lower alkyl substituted with phenyl or lower alkanoyloxy or a salt thereof with a pharmaceutically acceptable acid.

3,912,752

1-SUBSTITUTED-1,2,4-TRIAZOLES

Werner Meiser; Karl Heinz Büchel; Wolfgang Krämer, all of Wuppertal, and Ferdinand Grewe, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

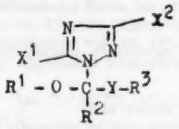
Filed Dec. 27, 1972, Ser. No. 318,963

Claims priority, application Germany, Jan. 11, 1972, 2201063

Int. Cl.² C07D *249/08*

U.S. Cl. 260—308 R **7 Claims**

1. A 1,2,4-triazole compound of the formula



in which

X^1 and X^2 each independently is hydrogen or alkyl of 1 to 3 carbon atoms,

R^1 is alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, or optionally substituted aryl of 6 to 10 carbon atoms or optionally substituted aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, the optional substituents being selected from the group consisting of halogen, nitro, alkyl of 1 to 6 carbon atmos, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 2 carbon atoms and 1 to 5 halogen atoms, haloalkylthio of 1 to 2 carbon atoms and 3 to 5 halogen atoms, haloalkylsulfonyl of 1 to 2 carbon atoms and 1 halogen atom and o- or p-linked phenyl,

R_2 and R^3 each independently is hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, or optionally substituted aryl of 6 to 10 carbon atoms or optionally substituted aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 to 2 carbon atoms in the alkyl moiety, the optional substituents being selected from the group consisting of halogen, nitro, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 or 2 carbon atoms and 1 to 5 halogen atoms, haloalkylthio of 1 or 2 carbon atoms and 3 to 5 halogen atoms, haloalkylsulfonyl of 1 or 2 carbon atoms and 1 halogen atoms and o- or p-linked phenyl, and

Y is $-C(O)-$, $-C(OH)_2-$ or $-C(OR)_2-$ wherein R is methyl or ethyl,

or a salt thereof with a physiologically compatible acid.

3,912,753

1-AMINOALKYLOXY, 1-AMINOALKYLTHIO AND 1-AMINOALKYLAMINO-4H-S-TRIAZOLO-[4,3-A][1,4] BENZODIAZEPINES

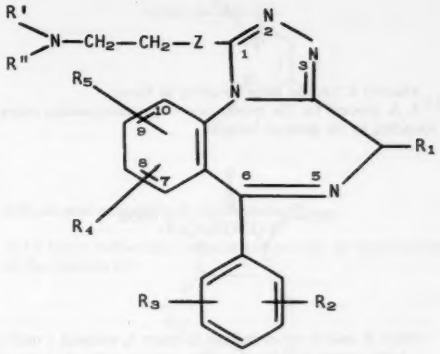
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 28, 1974, Ser. No. 473,684

Int. Cl.² C07D *487/04*

U.S. Cl. 260—308 R **9 Claims**

1. A compound of the formula



wherein Z is selected from the group consisting of O, S and N—R‴ wherein R‴ is lower alkyl of 1 through 3 carbon atoms; R_1 is selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms; R′ and R″ are selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms, with the proviso that R′ and R″ cannot be hydrogen when Z is N—R‴; R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, fluorine, chlorine, bromine, nitro, trifluoromethyl and lower alkylthio of 1 through 3 carbon atoms; and pharmacologically acceptable acid addition salts thereof.

3,912,754

ORGANIC POLYISOCYANATES AND METHOD OF MAKING THEM

Kurt Findeisen, Leverkusen, and Kuno Wagner, Leverkusen-Steinbuechel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

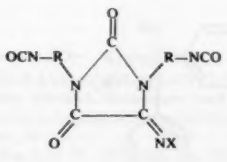
Filed June 3, 1974, Ser. No. 476,121

Claims priority, application Germany, June 8, 1973, 2329300

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.5 **5 Claims**

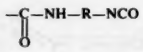
1. A polyisocyanate corresponding to the general formula



in which

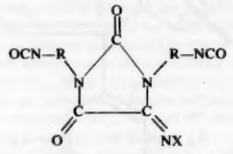
R represents an aliphatic C_2–C_{12} hydrocarbon radical, a cycloaliphatic C_4–C_{15} hydrocarbon radical, an aromatic C_6–C_{15} hydrocarbon radical or an araliphatic C_7–C_{15} hydrocarbon radical, and

X represents hydrogen or a group of the formula



wherein R has the same meaning as above.

3. A process for the production of polyisocyanates corresponding to the general formula



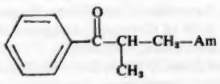
where R and X are as defined in claim 1, wherein 1 mol of hydrocyanic acid or a quantity, corresponding to 1 mol of hydrocyanic acid, of a compound which liberates hydrocyanic acid is reacted with at least 2 mols of an organic diisocyanate corresponding to the general formula $R(NCO)_2$ at a temperature of from −25° to +200°C.

3,912,755
PREPARATION OF PHARMACEUTICAL INTERMEDIATES

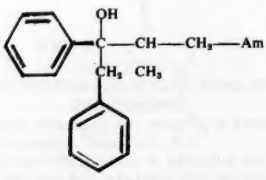
Richard N. Booher, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 30, 1974, Ser. No. 438,136
Int. Cl.² C07D *207/04*
U.S. Cl. 260—326.5 J **4 Claims**

1. The process for the preparation of the dl racemate of the ketone having the formula



wherein Am is dimethylamino or pyrrolidino, or a pharmaceutically acceptable nontoxic acid addition salt thereof, which comprises reacting an α-l or a β-dl carbinol of the formula



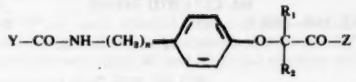
with a strong base selected from the group consisting of alkali metal and alkaline earth metal lower alkoxides, phenoxides, naphthoxides, hydroxides and hydrides, in the presence of an inert organic solvent.

3,912,756
NEW PHENOXYALKYL-CARBOXYLIC ACID COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Hans Peter Wolff; Ernst-Christian Witte, both of Mannheim; Kurt Stach, Mannheim-Waldhof; Harald Stork, Mannheim-Feudenheim, and Egon Roesch, Lampertheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed Mar. 11, 1974, Ser. No. 450,254
Claims priority, application Germany, Apr. 21, 1973, 2320387
Int. Cl.² C07D *209/18, 213/56, 231/14*
U.S. Cl. 260—326.13 R **10 Claims**

1. Phenoxyalkyl-carboxylic acid compounds of the formula



wherein

R_1 and R_2 are individually selected from hydrogen and methyl;

n is 1 or 2;

Z is hydroxyl or alkoxy; and

Y is 2-indolyl which may be optionally substituted on the benzene nucleus by halogen, lower alkyl or alkoxy;

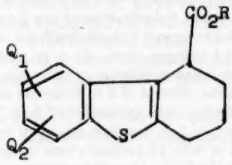
and the pharmacologically compatible salts thereof.

3,912,757
1,2,3,4-TETRAHYDRODIBENZOTHIOPHENE-1-CARBOXYLATES

Aram Mooradian, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,286
Int. Cl.² C07D *333/64*
U.S. Cl. 260—330.5 **8 Claims**

1. A compound having the formula



wherein R and Q_1 each are hydrogen; and Q_2 is selected from halo and phenyl.

3,912,758
POLYTHIOETHER IMPRESSION MATERIAL

Benjamin Weaver, Detroit, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,234
Int. Cl.² A61K *5/06*; **C08K** *5/01, 5/37*
U.S. Cl. 260—33.6 UA **5 Claims**

1. An impression material formed by polymerization by mixing together two paste like components:

a. component one comprising;

i. an acrylate monomer selected from a group consisting of hexanediol diacrylate, polyethylene glycol diacrylate and trimethylolpropane triacrylate,

ii. a mercaptan terminated polymer of molecular weight 1000–4000, having mercaptan groups available for crosslinking with said monomer, and

iii. said acrylate monomer making up about 6 parts by weight and said polymer making up about 100 parts by weight of component one;

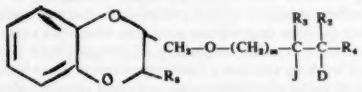
b. component two comprising;
i. alpha methyl styrene oligomer as plasticizer,
ii. a peroxide catalyst for initiating a reaction between said polymer and monomer of component one;
iii. triethylolamine as accelerator for speeding the reaction;
iv. said plasticizer making up 70 parts by weight, peroxide catalyst 100 parts by weight and triethylolamine 5 parts by weight of component two; and
c. components one and two each further comprising 100–200 parts by weight a filler and 10–15 parts by weight mineral oil.

3,912,759
BENZODIOXANE DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 235,000, March 15, 1972, Pat. No. 3,819,655. This application Feb. 19, 1974, Ser. No. 443,592
Claims priority, application Switzerland, Mar. 23, 1971, 4258/71
Int. Cl.² C07D *319/20*
U.S. Cl. 260—340.3 **2 Claims**

1. A compound of the formula:



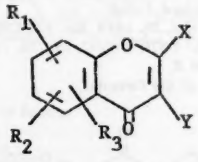
wherein R_3 is hydrogen or lower alkyl; R_5 is lower alkyl; R_6 is hydrogen or lower alkyl; D is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkenloxy, lower alkynyloxy, or lower alkanoyloxy; J is hydrogen or taken together with D forms a carbon to carbon bond or an oxygen bridge; and *m* is an integer from 1 to 2.

3,912,760
PROCESS FOR THE PRODUCTION OF CHROMONE DERIVATIVES AND INTERMEDIATES PRODUCED THEREBY

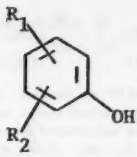
Daniel Kaminsky, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 18, 1973, Ser. No. 352,133
Int. Cl.² C07D *311/22, 317/54*
U.S. Cl. 260—340.5 **13 Claims**

1. A process for the preparation of a compound of the formula I:



wherein X represents hydrogen or lower alkyl; Y represents hydrogen, lower alkyl, or formyl, with at least one of X and Y being other than hydrogen, R_1 represents hydroxy, lower alkyl, or lower alkoxy; R_2 represents hydrogen, lower alkyl, or lower alkoxy; R_3 represents hydrogen, lower alkanoyl, or lower alkanoyloxy; and wherein R_1 and R_2, when attached to adjacent carbon atoms, together may form a methylenedioxy ring, which comprises treating a compound of the formula II:

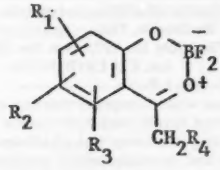


II

with an acid anhydride of the formula III:

$$(R_4CH_2CO)_2O \quad III$$

and a boron trifluoride compound to provide an intermediate of the formula IV:



IV

wherein R_1, R_2, and R_3 in formulas II, III and IV are as defined above and R_4 represents hydrogen or lower alkyl; and treating intermediate IV with a Vilsmeier reagent selected from the group consisting of phosphorus oxychloride together with dimethylformamide, and phosphorus oxychloride together with dimethylacetamide, followed by hydrolysis.

3,912,761
(-)-DI-O-ISOPROPYLIDENE-2-KETO-L-GULONATES

Charles William Den Hollander, Midland Park; Willy Leimgruber, Montclair, and Ernest Mohacsi, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 251,134, May 8, 1972, Pat. No. 3,855,227, which is a division of Ser. No. 795,333, Jan. 30, 1969, Pat. No. 3,682,925. This application Sept. 23, 1974, Ser. No. 508,128
Int. Cl.² C07D *317/26*
U.S. Cl. 260—340.9 **5 Claims**

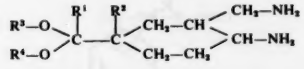
1. (+)-α-methylbenzylamine (−)-di-O-isopropylidene-2-keto-L-gulonate.

3,912,762
1-AMINO-2-AMINOMETHYL-CYCLOHEXANES

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Constance, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 19, 1973, Ser. No. 380,807
Claims priority, application Switzerland, July 28, 1972, 11294/72
Int. Cl.² C07D *319/06;* **C08G** *59/10*
U.S. Cl. 260—340.9 **9 Claims**

1. A 1-amino-2-aminomethyl-cyclohexane derivative of the formula



wherein R^1 and R^2 are the same or different and are hydrogen or alkyl of 1 to 5 carbon atoms, and R^3 and R^4 together are an unsubstituted or substituted alkylene radical with 2 to 3 carbon atoms in the main chain, in which case R^3 and R^4 can together contain an additional amino group.

3,912,763

OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

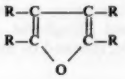
Floyd E. Farha, Jr.; Marvin M. Johnson, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 19, 1973, Ser. No. 380,724

Int. Cl.² C07D *307/36*

U.S. Cl. 260—346.1 R **16 Claims**

1. A process which comprises reacting oxygen and at least one unsaturated acyclic feed hydrocarbon selected from the group consisting of alkenes and alkadienes having from 4 to 10 carbon atoms, in contact with a catalyst comprising phosphorus, vanadium, oxygen and cobalt under suitable reaction conditions for conversion of said at least one unsaturated acyclic feed hydrocarbon to at least one furan compound having the formula



wherein each R is individually selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms, the total carbon atoms in the R radicals being in the range of 0 to 6; and recovering at least a portion of the furan compounds thus produced.

3,912,764

PREPARATION OF ALKENYL SUCCINIC ANHYDRIDES

John F. Palmer, Jr., Ladue, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

Filed Sept. 29, 1972, Ser. No. 293,577

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 **8 Claims**

1. A process for the production of alkenyl succinic anhydrides, comprising: thermally reacting an olefin polymer having an average molecular weight in the range of 200 to 50,000 with maleic anhydride until at least one-half but not all of the maleic anhydride has reacted and then continuing the reaction in the presence of an amount of chlorine less than one mole per mole of maleic anhydride present at the end of the thermal reaction.

3,912,765

TETRASODIUM AND TETRAPOTASSIUM SALTS OF TETRAHYDROFURAN-2,2,5,5-TETRACARBOXYLIC ACID

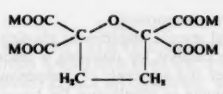
Chung Yu Shen, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 23, 1972, Ser. No. 282,992

Int. Cl.² C07D *307/18*

U.S. Cl. 260—347.3 **2 Claims**

1. A compound represented by the formula



and hydrates thereof, wherein M is selected from the group consisting of sodium and potassium.

3,912,766

REGENERATION OF DEGRADED QUINONES FOR THE PRODUCTION OF HYDROGEN PEROXIDE

William Reid Logan, Kingsley, and Alan Rippon, Liverpool, both of England, assignors to Laporte Industries Limited, London, England

Filed Dec. 11, 1972, Ser. No. 313,624

Claims priority, application United Kingdom, Dec. 20, 1971, 059029/71

Int. Cl.² C07D *49/68*; C01B *15/025*

U.S. Cl. 260—369 **3 Claims**

1. In a process for the regeneration of useful quinone compounds in a working solution degraded during use in a cyclic process for the production of hydrogen peroxide, wherein said working solution is alternately hydrogenated to provide a reduced working solution and oxidized to provide an oxidized working solution, said working solution containing at least some useful quinone or quinol compounds, quinone epoxides and other quinone degradation products, wherein a regeneration treatment consists essentially of bringing into contact with said working solution a solid regeneration agent selected from alkali metal aluminosilicates, activated alumina, alkaline earth metal hydroxides and oxides, base exchanged in exchangers and non-alkaline activated alumina or liquid regeneration agent selected from aqueous alkali metal hydroxide solution for a period of from 1 minute to 20 hours at a temperature of from ambient temperature to the temperature at which said working solution boils, an improvement consisting essentially of subjecting said working solution to a combination of at least two different regeneration treatments wherein one treatment said working solution is said reduced working solution and in the other treatment said working solution is said oxidized working solution.

3,912,767

NOVEL SULFONATE ESTERS OF 2-HYDROXY-3-(METHYLTHIO)-1,4-NAPHTHOQUINONE

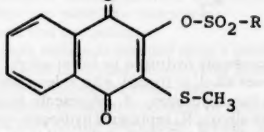
Joseph William Marisco, Jr., Pearl River, and Leon Goldman, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1974, Ser. No. 516,561

Int. Cl.² C07C *143/02*, *143/26*, *143/28*

U.S. Cl. 260—396 R **10 Claims**

1. Compounds of the formula:



wherein R is selected from the group consisting of lower alkyl, phenyl, and a moiety of the formula:

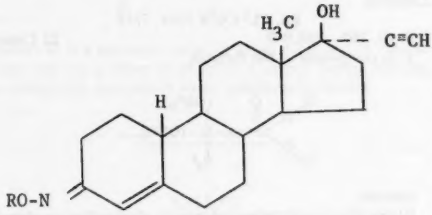
wherein R′ is lower alkyl or halogen.

3,912,768
NORETHINDRONE O-ALKYLOXIMES

Rinaldo Gardi, Carate Brianza; Romano Vitali, Monza, and Giovanni Falconi, Milan, all of Italy, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 17, 1973, Ser. No. 398,114
Claims priority, application Italy, Sept. 26, 1972, 29677/72
Int. Cl.² C07J
U.S. Cl. 260—397.5 **16 Claims**

1. O-alkyloximes of norethindrone of the formula:



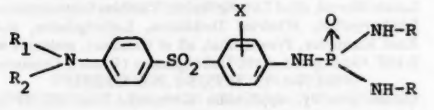
wherein R represents a saturated or mono-unsaturated open-chain aliphatic hydrocarbon radical or a cyclic aliphatic hydrocarbon radical, each of said radicals containing up to 5 carbon atoms.

3,912,769
N-(4-SULFANILYLPHENYL) PHOSPHORIC ACID TRIAMIDES

Tsung-Ying Shen, Westfield, and Norman P. Jensen, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 284,788, Aug. 30, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,523
Int. Cl.² C07C *147/12*
U.S. Cl. 260—397.6 **6 Claims**

1. A compound of structural formula:



wherein
X is hydrogen or fluoro;
R is
a. lower alkyl,
b. phenyl-lower alkyl,
c. halophenyl-lower alkyl,
d. lower alkylphenyl-lower alkyl,
e. lower alkoxyphenyl-lower alkyl,
f. lower cycloalkyl,
g. phenyl,
h. halophenyl,
i. lower alkylphenyl,
j. lower alkoxyphenyl,
k. lower alkoxycarbonyl-lower alkyl,
l. di(lower alkyl)amino-lower alkyl,
m. adamantanyl;
R_1 is hydrogen;
R_2 is hydrogen or

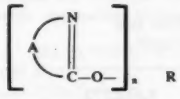
wherein R_3 is
a. lower alkyl,
b. halo-lower alkyl,
c. amino-lower alkyl,
d. phenyl-lower alkyl,
e. carboxy-lower alkyl,
f. lower cycloalkyl,
g. a 5–6 membered heterocycle wherein the hetero atom is oxygen or nitrogen selected from furyl, pyridyl, imidazolyl, and imidazolidinyl.

3,912,770
ESTER ISOCYANATES

Arthur Botta, Krefeld-Gartenstadt, and Heinrich Krimm, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 9, 1970, Ser. No. 17,961
Claims priority, application Germany, Mar. 15, 1969, 1913273
Int. C3² *7/00*
U.S. Cl. 260—404 **8 Claims**

1. A method for the preparation of ester isocyanates which comprises reacting at a temperature of from about −15°C. to about 25°C. 1 mol of a lactimether, having the generall formula:



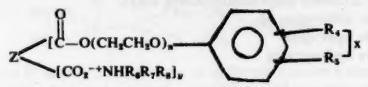
wherein *n* is an integer of from 1 to 4, R is an n-valent aliphatic, cycloaliphatic, araliphatic or aromatic radical which may also contain halogen, nitro, nitrilo, oxo, ether, thioether, ester or tertiary amino groups and A is a bivalent aliphatic radical with at least 1 mol of phosgene in the presence of water and an inert organic solvent, the solvent being substantially immiscible with the water, in the presence of a compound which undergoes a neutralization reaction with hydrogen chloride.

3,912,771
ALKYL AMMONIUM CARBOXYLATE SALT-ETHOXYLATED ALKYL PHENOL ESTERS OF A DIMER OR TRIMER ACID

Robert R. Kuhn, Lansdale, and Warren H. Machleder, Bluebell, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 279,891, Aug. 11, 1972, Pat. No. 3,782,912, and a continuation-in-part of Ser. No. 356,655, May 2, 1973, Pat. No. 3,846,089. This application July 16, 1973, Ser. No. 379,670
Int. Cl.² C07C *69/00*
U.S. Cl. 260—404.5 **6 Claims**

1. Surface active alkyl ammonium carboxylate salt-ethoxylated alkyl phenol ester of a trimer or dimer acid of the formula



where n is an average number from about 1 to 12.5; and wherein in the case of the salt-ester derived from a trimer acid x is an average number of from about 1 to 2, and

y is an average number of from about 1 to 2, the sum of x and y being 3;

and in the case of the salt-ester derived from a dimer acid, both x and y are each on the average 1, the sum of x and y being 2;

R_4 is an alkyl group containing 4 to 12 carbon atoms;

R_5 is H or an alkyl group containing 4 to 12 carbon atoms;

R_6 is an alkyl group containing 1 to 24 carbon atoms which may be straight or branched chain or an amine substituted alkyl group of 2 to 24 carbon atoms; R_7 is H or is the same as R_6, R_8 is H or is the same as R_6; and

Z is a saturated or unsaturated hydrocarbon residue of the acid, said hydrocarbon residue having 34 to 51 carbon atoms.

3,912,772

PROCESS FOR THE PREPARATION OF α-ALKYL HYDRACRYLIC ACIDS AND α-ALKYL ACRYLIC ACIDS.

Philip E. Pfeffer, Warrington, and Leonard S. Silbert, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 18, 1971, Ser. No. 190,318

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **15 Claims**

1. A process for the preparation of α-substituted hydracrylic acids comprising reacting formaldehyde with a lithium α-lithio carboxylate of a corresponding acid selected from the group consisting of saturated and non-conjugated, unsaturated alkanoic acids.

7. α-Dodecylhydracrylic acid

11. α-Dodecylacrylic acid

3,912,773

CASTING RESIN SYSTEM CONTAINING ACRYLIC POLYMER IN ACRYLIC MONOMER, DIEPOXIDE, AND POLYETHYLENICALLY UNSATURATED MONOMER

Stephen Havriliak, Huntington Valley, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

Filed July 22, 1974, Ser. No. 490,457

Int. Cl.² C08K *5/15;* **C08L** *63/00*

U.S. Cl. 260—42.28 **9 Claims**

1. In a casting resin system comprising about 50 to 70 parts by weight of monethylenically unsaturated monomer selected from the group consisting of alkyl and cycloalkyl methacrylates, styrene, substituted styrene, and mixtures thereof, about 2 to 10 parts by weight of an α,β-monoethylenically unsaturated carboxylic acid, about 20 to 35 parts by weight of a thermoplastic addition polymer of at least one monomer selected from the group consisting of alkyl and cycloalkyl methacrylates, styrene, substituted styrene, and mixtures thereof, and about 1 to 10 parts by weight of a diepoxide, the improvement comprising further including about 0.1 to 5 parts by weight per 100 parts resin system of a polyethylenically unsaturated monomer.

9. 100 parts by weight of a two part casting resin system comprising a major amount of monoethylenically unsaturated monomer selected from the group consisting of alkyl and cycloalkyl methacrylates, styrene, substituted styrene, and mixtures thereof, an α,β-monoethylenically unsaturated carboxylic acid, a minor amount of a thermoplastic addition polymer of at least one monomer selected from the group consisting of alkyl and cycloalkyl methacrylates, styrene, substituted styrene, and mixtures thereof, about 1 to 10 parts by weight of and about 0.1 to 5parts by weight per 100 parts resin system of a polyethylenically unsaturated monomer, the proportion of diepoxide to acid selected so as to result in substantially complete reaction of the epoxy group upon curing, wherein all of the α,β-monoethylenically unsaturated acid is contained in one part and all of the diepoxide is contained in the other part.

3,912,774

ORGANOSILANE ESTERS OF TERTIARY ALCOHOLS

Hans Joachim Kotzsch, Rheinfelden, and Hans Joachim Vahlensieck, Wehr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

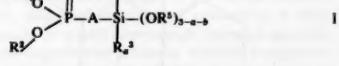
Filed Jan. 25, 1974, Ser. No. 436,775

Claims priority, application Germany, Jan. 31, 1973, 2304554

Int. Cl.² C07F *7/04, 7/18*

U.S. Cl. 260—448.8 R **21 Claims**

1. A compound of the formula



I

wherein

R^1 and R^2 are each independently an alkyl radical or phenyl;

R^3 and R^4 are each independently an alkyl radical having 1 to 8 carbon atoms;

R^5 is a tertiary alkyl radical;

A is a bivalent alkenyl radical;

$a = 0$ or 1;

$b = 0$, 1 or 2;

$a + b$ does not exceed 2.

3,912,775

CATALYST AND ITS USE FOR THE MANUFACTURE OF METHANE FROM GASES CONTAINING CARBON MONOXIDE AND DIOXIDE AND HYDROGEN

Franz Josef Broecker; Guenter Zirker; Bruno Triebskorn; Laszlo Marosi, all of Ludwigshafen; Matthias Schwarzmann, Limburgerhof; Winfried Dethlefsen, Ludwigshafen, and Knut Kaempfer, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 13, 1973, Ser. No. 415,292

Claims priority, application Germany, Nov. 15, 1972, 2255877

Int. Cl.² C07C *27/06*

U.S. Cl. 260—449.6 **2 Claims**

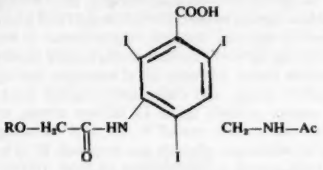
1. A process for the manufacture of methane by conversion of a gas which contains carbon monoxide, carbon dioxide and hydrogen and which has been preheated to a temperature of from 200° to 300°C, at superatmospheric pressure in the presence of a nickel catalyst, wherein the catalyst is manufactured by precipitating the compound $Ni_6Al_2(OH)_{16}.CO_3.4H_2O$ from aqueous solution, drying it at a temperature of from 80° to 180°C, calcining it at a temperature of from 300° to 550°C and subsequently reducing it in a stream of hydrogen, with the proviso that between the drying stage and the calcination stage the temperature is raised at a rate in the range from 1.66°/minute to 3.33°C/minute.

3,912,776
NOVEL HYDROXY- AND ALKOXY-ACETAMIDOTRIIODOBENZOIC ACIDS

Heinrich Pfeiffer; Wolfgang Beich, and Georg Zollner, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed May 15, 1972, Ser. No. 253,026
Claims priority, application Germany, May 15, 1971, 2124904
Int. Cl.² C07C *103/34*
U.S. Cl. 260—501.11 **9 Claims**

1. Hydroxy- and alkoxy-acetamidotriiodobenzoic acids of the formula



wherein R is a hydrogen atom or lower-alkyl of 1–4 carbon atoms and Ac is alkanoyl of up to 4 carbon atoms, and the physiologically acceptable water soluble salts thereof.

3,912,777
USE OF SULFURIC ACID AS AN EXTRACTANT IN OLEFIN SULFONATION

Jerome Stanley Schrager, Cedar Grove, N.J.; Joseph Rubinfeld, Brooklyn, N.Y., and Thomas Joseph Trombone, Brooklyn, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 22, 1967, Ser. No. 624,982
Int. Cl. C07c *143/16*
U.S. Cl. 260—504 **14 Claims**

1. A process for the production of sulfonated olefins, comprising reaction SO_3 with an olefin of 8 to 30 carbon atoms to produce an acid mix, adding an aqueous sulfuric acid extractant of 5 to 85% concentration to said acid mix, the amount of water in said extractant being over 10% of the weight of said mix, to produce a mixture comprising a liquid aqueous sulfuric acid phase and an organic phase containing the major proportion of said acid mix and separating said sulfuric acid phase from said organic phase.

3,912,778
PROCESS FOR THE PREPARATION OF 3-KETO-GLUTARIC ACID BY CARBOXYLATION OF ACETONE IN GLIME

Enzo Alneri; Giorgio Bottaccio, both of Novara; Vittorio Carletti, Meda (Milan), and Giulio Lana, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed June 12, 1974, Ser. No. 478,724
Claims priority, application Italy, June 20, 1973, 25640/73
Int. Cl.² C07C *55/12*
U.S. Cl. 260—535 P **8 Claims**

1. In a process for the preparation of alkali metal salt of 3-keto-glutaric acid by carboxylation of acetone in the presence of an alkali metal phenate, the improvement which comprises conducting said carboxylation in a solvent having the general formula:

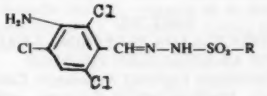
$R-O-CH_2-CH_2-O]_n$ R wherein R is a C_1–C_4 alkyl; and wherein *n* is an integer of 1–10.

3,912,779
3-AMINO-2,4,6-TRICHLORO-BENZALDEHYDE-SULFONYLHYDRAZONES

Horst Tarnow, Langenfeld, and Gunther Hermann, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 27, 1973, Ser. No. 374,195
Claims priority, application Germany, Feb. 13, 1973, 2306918
Int. Cl.² C07C *143/825*
U.S. Cl. 260—556 H **5 Claims**

1. A benzaldehyde-sulfonylhydrazone of the formula



(I)

in which

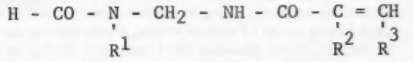
R is an optionally halogen-substituted alkyl radical of 1–4 carbon atoms, or a phenyl or naphthyl radical which is optionally substituted by one or more alkyl or haloalkyl radicals of 1–4 carbon atoms, halogen or NO_2 radicals.

3,912,780
SUBSTITUTED METHYLENE DIAMINES

Joachim Ribka, Offenbach am Main-Burgel; Steffen Piesch, Oberursel, Taunus, and Friedrich Engelhardt, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

Filed Oct. 23, 1973, Ser. No. 408,486
Claims priority, application Germany, Oct. 23, 1972, 2251921
Int. Cl.² C07C *103/64*
U.S. Cl. 260—561 N **5 Claims**

1. A compound of the formula



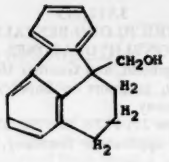
wherein R^1 is hydrogen or alkyl having 1 to 5 carbon atoms and each of R^2 and R^3 is hydrogen or methyl.

3,912,781
1-HYDROXYMETHYL-1,2,3,4-TETRAHYDROFLUORANTHENE

Carl Finger, Castrop-Rauxel; Heinz-Gerhard Franck, Duisburg-Meiderich; Johannes Turowski, deceased, late of Castrop-Rauxel, by Else Paula Maria Turowski nee Hinz, heir, Castrop-Rauxel; and Maximilian Zander, Castrop-Rauxel, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 37,052, May 13, 1970, abandoned.
This application Oct. 24, 1972, Ser. No. 298,203
Claims priority, application Germany, June 24, 1969, 1931946
Int. Cl.² C07C *33/06*
U.S. Cl. 260—618 F **1 Claim**

1. The compound 1-hydroxymethyl-1,2,3,4-tetrahydrofluoranthene corresponding to the structural formula



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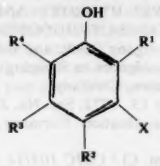


wherein

X is halogen

R^1,R^2,R^3, and R^4 independently of one another are selected from the group of hydrogen, halogen, alkyl having up to 12 carbon atoms, benzyl, phenyl, benzyl and phenyl substituted by hydroxy, halogen and/or linear or branched alkyl having up to 12 carbon atoms alkoxy having up to 12 carbon atoms, phenoxy alkyl mercapto having up to 12 carbon atoms, and dialkylaminomethyl wherein the alkyl groups contain up to 12 carbon atoms, with the proviso that at least one of R^1, R^2 or R^4 is halogen and when 3,5-dihalogen-phenols are prepared, R^3 is halogen, with hydrogen at a temperature of from 100°to 350°C under a hydrogen pressure of from 20 to 250 atm in the presence of 0.1 to 20% by weight of a catalyst comprising a noble metal of Group VIII of the Periodic System, or an oxide or sulfide thereof, and sulphur and/or a sulphur compound selected from the group of sodium sulphide, potassium sulphide, calcium sulphide, manganese sulphide, iron sulphide, cobalt sulphide, nickel sulphide, copper sulphide, silver sulphide, cadmium sulphide, antimony sulphide, lead sulphide, sodium thioethylate, silver thioethylate, carbon disulphide and thiourea, in a ratio of 0.5 to 30 mol of sulphur or sulphur compound to one mol of said noble metal or oxide or sulfide thereof.

3,912,782

CATALYTIC PROCESS FOR PREPARING 3-HALOGEN- AND 3,5-DIHALOGEN-PHENOLS

Wolfgang Kiel, Schildgen; Karlfried Wedemeyer, Cologne, and Werner Evertz, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

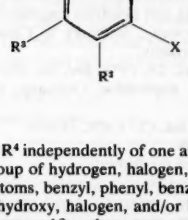
Filed Nov. 28, 1973, Ser. No. 419,853

Claims priority, application Germany, Sept. 6, 1973, 2344926

Int. Cl.² C07C *39/24, 39/28, 39/29*

U.S. Cl. 260—620 **9 Claims**

1. Process for preparing 3-halogen- and 3,5-dihalogen-phenols by the dehalogenation of higher halogenated phenols which comprises reacting a halogen compound having the formula



wherein

X is halogen

R^1, R^2, R^3 and R^4 independently of one another are selected from the group of hydrogen, halogen, alkyl having up to 12 carbon atoms, benzyl, phenyl, benzyl and phenyl substituted by hydroxy, halogen, and/or linear or branched alkyl having up to 12 carbon atoms, alkoxy having up to 12 carbon atoms, phenoxy alkyl mercapto having up to 12 carbon atoms and dialkylaminomethyl wherein the alkyl groups contain up to 12 carbon atoms, with the proviso that at least one of R^1, R^2 or R^4 is halogen and when 3,5-dihalogenphenols are prepared, R^3 is halogen, with hydrogen at a temperature of from 100° to 350°C under a hydrogen pressure of from 20–250 atm in the presence of 0.5 to 20% by weight of a catalyst consisting essentially of a sulfide or polysulfide of Fe, Co, or Ni or mixtures of these metal sulfides or polysulfides.

3,912,783

PROCESS AND CATALYST FOR PREPARING OF 3-HALOGEN-AND 3,5-DIHALOGEN-PHENOLS

Karlfried Wedemeyer, Cologne; Eliahu Koppelmann, Leverkusen, and Werner Evertz, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 28, 1973, Ser. No. 419,855

Claims priority, application Germany, Dec. 5, 1972, 2259433; Sept. 6, 1973, 2344925

Int. Cl.² C07C *39/24, 39/28, 39/29*

U.S. Cl. 260—620 **8 Claims**

1. Process for preparing 3-halogen- and 3,5-dihalogen-phenols by the dehalogenation of higher halogenated phenols which comprises reacting a halogen compound having the formula

wherein

X is halogen

R^1,R^2,R^3, and R^4 independently of one another are selected from the group of hydrogen, halogen, alkyl having up to 12 carbon atoms, benzyl, phenyl, benzyl and phenyl substituted by hydroxy, halogen and/or linear or branched alkyl having up to 12 carbon atoms alkoxy having up to 12 carbon atoms, phenoxy alkyl mercapto having up to 12 carbon atoms, and dialkylaminomethyl wherein the alkyl groups contain up to 12 carbon atoms, with the proviso that at least one of R^1, R^2 or R^4 is halogen and when 3,5-dihalogen-phenols are prepared, R^3 is halogen, with hydrogen at a temperature of from 100°to 350°C under a hydrogen pressure of from 20 to 250 atm in the presence of 0.1 to 20% by weight of a catalyst comprising a noble metal of Group VIII of the Periodic System, or an oxide or sulfide thereof, and sulphur and/or a sulphur compound selected from the group of sodium sulphide, potassium sulphide, calcium sulphide, manganese sulphide, iron sulphide, cobalt sulphide, nickel sulphide, copper sulphide, silver sulphide, cadmium sulphide, antimony sulphide, lead sulphide, sodium thioethylate, silver thioethylate, carbon disulphide and thiourea, in a ratio of 0.5 to 30 mol of sulphur or sulphur compound to one mol of said noble metal or oxide or sulfide thereof.

3,912,784

PRODUCTION OF PHENOL BY DECARBOXYLATIVE HYDROLYSIS OF A CHLOROBENZOATE SALT

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 30, 1969, Ser. No. 837,385The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.² C07C *37/00, 37/02*

U.S. Cl. 260—621 R **3 Claims**

1. Process for the production of phenol from toluene which comprises:

a. monochlorinating toluene under benzene ring chlorination conditions;

b. oxidizing the monochlorotoluene to monochlorobenzoic acid under benzene side-chain liquid phase oxidation conditions;

c. converting the monochlorobenzoic acid to an alkali, alkaline earth metal, or ammonium salt by reacting the monochlorobenzoic acid with an alkali, alkaline earth metal or ammonium base,

d. charging the monochlorobenzoic acid salt, water and a strong inorganic base to a reaction zone wherein for each mol of the acid salt there is present from about 3 to 5 mols of the base, and from about 5 to 250 mols of water, and maintaining the zone at a temperature in the range from about 150° to 300°C., and at a pressure sufficient to maintain the water in the liquid phase for a reaction period in the range from about 0.1 to 10 hours, said base having a base strength at least of the order of that of ammonium hydroxide; and

e. thereafter acidifying the resulting hydrolysis mixture and recovering phenol.

3,912,785

OXO-RELATED REACTION MAKING TRIETHANOLMETHANE AND 3-METHYLPENTANEDIOL-1,5 FROM HEXENEDIOLS

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 11, 1973, Ser. No. 423,831
Int. Cl.² C07C 29/16
U.S. Cl. 260—635 R 7 Claims

1. A process for producing triethanolmethane and 3-methyl-1,5-pentanediol which comprises contacting a mixture of 3-methylene-1,5-pentanediol and 3-methyl-2-pentene-1,5-diol with a rhodium carbonyl complex catalyst in homogeneous liquid phase with the mixture, and in the presence of carbon monoxide at a partial pressure between 25 and 5000 psig and hydrogen at a partial pressure between 50 and 10,000 psig, and at a temperature between 75° and 250°C for a time sufficient to react at least 90% of the olefinic double bonds.

3,912,786

PROCESS FOR PRODUCING BICYCLO-[3,3,0]-OCTENE-(2)

Günther Wilke; Borislav Bogdanovic, both of Mulheim (Ruhr), and Hans-Georg Nüssel, Hamburg, all of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim (Ruhr), Germany

Continuation of Ser. No. 210,252, Dec. 20, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 444,949
Claims priority, application Germany, Dec. 22, 1970, 2063149
Int. Cl.² C07C 13/00
U.S. Cl. 260—666 PY 13 Claims

1. Process for producing bicyclo-[3,3,0]-octene-(2) from cyclooctadiene-(1,5), which comprises using a catalyst consisting essentially of (a) a nickel material with (b) a halogen-containing aluminum material wherein said nickel material is an organonickel compound selected from nickel salts of organic acids, nickel halides, nickel alcoholate, nickel phenate, nickel acetyl acetonate, π-allyl nickel acetyl acetonate, bis (π-allyl)-nickel and cyclooctenyl nickel acetyl acetonate.

3,912,787

SELECTIVE PARTIAL HYDROGENATION OF AROMATICS

Gerhard P. Nowack, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 275,348, July 26, 1972, abandoned. This application June 21, 1974, Ser. No. 481,774
Int. Cl.² C07C 5/10
U.S. Cl. 260—667 18 Claims

1. A process for the conversion of aromatic hydrocarbons to the correspondinig cyclic olefins which consists essentially in partially hydrogenating said aromatic hydrocarbons in an aqueous dispersion maintained at essentially neutral or acid pH conditions with hydrogen under hydrogenation conditions and with a catalyst composed of ruthenium plus a metal selected from the group consisting of manganese, cobalt, and nickel supported on alumina or zinc aluminate.

10. A process for the conversion of aromatic hydrocarbons to the corresponding cyclic olefins which comprises partially hydrogenating said aromatic hydrocarbons in an aqueous phase maintained at essentially neutral or acid pH conditions with hydrogen under hydrogenation conditions in the presence of a supported ruthenium catalyst promoted with at least one metal selected from the group consisting of chromium, molybdenum, tungsten, manganese, cobalt, nickel, and iron.

3,912,788

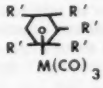
METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 459,871
Int. Cl.² C07C 3/52
U.S. Cl. 260—668 C 9 Claims

1. The process of alkylating an aromatic substrate with an organic halide comprising the steps of: charging a reaction vessel with a metallic hexacarobnyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula

wherein R′ is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, aryl groups having from 6 to about 12 carbon atoms including alkyl substituents, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an organic halide having the general formula RX wherein R is an aryl group having from 7 to about 12 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said organic halide with generation of a carbonium ion from said organic halide so that said carbonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,912,789

DEALKYNATION OF OLEFIN AND DIOLEFIN STREAMS

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1973, Ser. No. 425,408
Int. Cl.² C07C 7/01
U.S. Cl. 260—681.5 7 Claims

1. A process for removing alpha-acetylenes from a liquid hydrocarbon stream which comprises contacting said stream in the liquid state and containing dissolved hydrogen gas at about 10°–150°C. with a bed of supported catalyst consisting essentially of a mixture of finely divided copper metal and a minor proportion of at least one polyvalent activator metal of the group consisting of silver, platinum, palladium, manganese, cobalt, nickel, chromium, and molybdenum supported on gamma alumina having a surface area of at least about 10 sq. meters per gram and containing about 0.1–1.5 percent by weight of Na_2O.

3,912,790
COMPOSITIONS FOR PRODUCING EXTENSIBLE COATINGS

Wen-Hsuan Chang, Gibsonia, and Marvis E. Hartman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 839,648, July 7, 1969, abandoned. This application Oct. 29, 1973, Ser. No. 410,660

Int. Cl.² C08L *61/20, 67/20*

U.S. Cl. 260—849 **7 Claims**

1. A one-package, storage stable, ungelled coating composition comprising:

A. about 95 percent by weight to about 50 percent by weight, based on the combined weight of (A) and (B), of an ungelled, hydroxyl-containing urethane reaction product, having a hydroxyl value between about 10 and about 200, produced by the method of comprising:

1. reacting an organic polyisocyanate with an active hydrogen-containing material selected from the group consisting of polyester polyols, low molecular weight monomeric diols, and diamines, thereby forming an isocyanato-terminated adduct, and

2. reacting said isocyanato-terminated adduct with polyether polyol, having an hydroxyl equivalent of at least about 100 and a glass transition temperature below about 25°C., whereby said active hydrogen-containing material provides hard segments in said urethane reaction product and whereby said polyether polyol provides soft segments in said urethane reaction product; and whereby said urethane reaction product has a major proportion of said soft segments and a minor proportion of said hard segments; and

B. about 5 percent to about 50 percent by weight, based on the combined weight of (A) and (B), of an aminoplast resin.

3,912,791
TERTIARY-ALKYL HALOCUMYL PEROXIDES

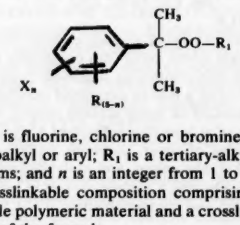
Richard Anthony Bafford, Aiken, S.C., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 13,792, Feb. 25, 1970, Pat. No. 3,755,464, which is a continuation-in-part of Ser. No. 771,344, Oct. 28, 1968. This application Aug. 20, 1973, Ser. No. 389,769

Int. Cl.² C08J *3/24;* **C08K** *5/14*

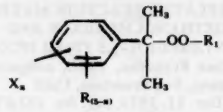
U.S. Cl. 260—861 **10 Claims**

1. The method of crosslinking a curable composition comprising heating a mixture of a free radical crosslinkable polymeric material and a crosslinking amount of an organic peroxide and recovering crosslinked polymeric material, the peroxide being of the formula



wherein X is fluorine, chlorine or bromine; R is hydrogen, alkyl, cycloalkyl or aryl; R_1 is a tertiary-alkyl radical of 4–8 carbon atoms; and n is an integer from 1 to 5.

2. A crosslinkable composition comprising a free radical crosslinkable polymeric material and a crosslinking amount of a peroxide of the formula



wherein X is fluorine, chlorine or bromine; R is hydrogen, alklyl, cycloalkyl or aryl; R_1 is a tertiary-alkyl radical of 4–8 carbon atoms; and n is an integer from 1to 5.

3,912,792
FLAME RETARDANT COMPOSITIONS

Irving Touval, Edison, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 278,016, Aug. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 175,694, Aug. 27, 1971, abandoned. This application May 21, 1973, Ser. No. 361,895

Int. Cl.² C08K *3/06, 3/22, 5/02, 5/52*

U.S. Cl. 260—863 **4 Claims**

3. An improved flame retardant composition comprising an inherently flammable polymer selected from the group consisting of polyolefins, polymers of acrylic acid esters, polystryene, crosslinked products derived from unsaturated polyesters and copolymers of acrylonitrile with at least one comonomer selected from the group consisting of styrene and butadiene, and between 20 and 40%, based on the weight of said composition, of a mixture comprising one part by weight of antimony oxide and between one and twelve parts of a halogen-containing organic compound exhibiting a volatilization temperature above 200°C. and selected from the group consisting of Diels-Alder adducts derived from 2 moles of a hexahalocyclopentadiene per mole of a cyclic hydrocarbon containing two carbon-carbon double bonds, perhalocyclopentadecanes and halogenated biphenyls, wherein the improvement resides in the presence of (1) between 0.5 and 20%, based on the combined weight of the antimony oxide and halogen-containing organic compound, of at least one phosphorus compound selected from the group consisting of tris(halophenyl)-phosphates and tris(halophenyl)thiophosphates, wherein each phenyl radical exhibits at least three halogen atoms and all halogens present in the flame retardant are selected from the group consisting of bromine and chlorine, and (2) suflur, in an amount up to 50%, based on the weight of the said phosphorus compound.

3,912,793
BLOCK COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Shigeki Horiie, Yokohama; Shin-ichiro Asai, Tokyo; Yoshihisa Moriya, Tokyo, and Chiaki Saito, Tokyo, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 25, 1973, Ser. No. 400,608

Claims priority, application Japan, Sept. 29, 1972, 47-97768

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 B **4 Claims**

1. A block copolymer having a polymeric chain consisting essentially of a central polymer block formed of homopolymer blocks of butadiene or isoprene or copolymer blocks of a major amount of butadiene or isoprene with a minor amount of copolymerizable monomer, homopolymer blocks of α-methyl-styrene attached to said central block and, attached to said homopolymer blocks of α-methyl-styrene, tapered copolymer blocks of styrene and α-methyl-styrene, the proportion of styrene units in said copolymer blocks increasing towards their ends distant from the α-methylstyrene homopolymer blocks, and terminal homopolymer blocks of styrene attached to said tapered copolymer blocks, said central polymer block and said α-methyl-styrene units being present in

amounts of 15 to 80 wt.% and 15 to 60 wt.% respectively, based on the copolymer.

3,912,794

PRODUCTION OF ABS RESINS

William J. I. Bracke, Hamme, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Nov. 12, 1973, Ser. No. 415,240

Claims priority, application France, Nov. 21, 1972, 72.41253

Int. Cl.² C08L 47/00

U.S. Cl. 260—880 R 13 Claims

1. A process for the production of ABS type resins comprising a styrenic compound-acrylonitrile compound copolymer and polybutadiene rubber on which said styrenic compound and acrylonitrile compound are graft copolymerized, said process comprising carrying out a mass-copolymerization of a styrenic compound and an acrylonitrile compound in the presence of polybutadiene rubber, at a temperature of between 75° and 125°C., up to formation of a mass copolymer having a viscosity of between about 5,000 and 100,000 centipoises when measured at 65°C. and in which the continuous phase is a styreneic compound-acrylonitrile compound copolymer which contains styrenic and acrylonitrile monomeric compounds and polybutadiene rubber, adding to said mass copolymer an aqueous dispersion of a suspending agent, said suspending agent being capable of absorbing a non-ionic or ionic surface active agent and subsequently adding to the combined mass copolymer and aqueous dispersion a non-ionic or ionic surface active agent in an amount sufficient to produce upon suspension polymerization polymer beads having an average size between about 0.2 and 0.4 mm, and thereafter carrying out a suspension polymerization at a temperature of between 75 and 150°C.

3,912,795

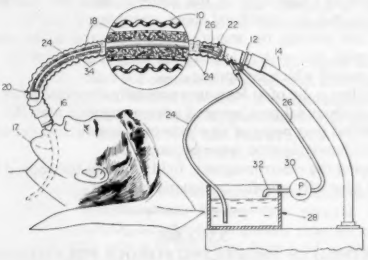
HUMIDIFYING GAS

Richard R. Jackson, Eight Trinity Road, Marblehead, Mass. 01947

Continuation-in-part of Ser. No. 301,773, Oct. 30, 1972, Pat. No. 3,871,373. This application Dec. 3, 1973, Ser. No. 421,021

Int. Cl. A61m 15/00

U.S. Cl. 261—36 R 11 Claims



1. Apparatus for humidifying a gas and delivering it to be breathed, comprising

a gas chamber having an inlet for communication with a source of said gas, and an outlet,

a water chamber coextensive over a zone with a portion of said gas chamber,

one of said chambers having a wall permeable to water vapor at said zone,

means for bringing water into intimate contact with one side of said wall at said zone at a vapor pressure sufficient to cause passage of water vapor through said wall and into said gas chamber to humidify gas therein, said means comprising water return and supply tubes effectively sealed to said water chamber and arranged for respective connection to a source of vacuum and a water reservoir exposed to atmospheric pressure, and

a porous filler within said water chamber to preserve a water flow volume therein despite the compressive force of the atmosphere during operation.

3,912,796

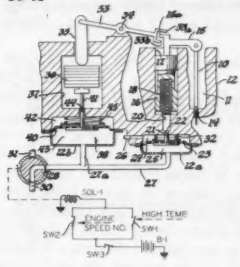
CARBURETOR WITH ALTITUDE AND T-MECS METERING CONTROL

Reed M. Brown, III, Fairport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1974, Ser. No. 468,756

Int. Cl.² F02M 7/20

U.S. Cl. 261—39 A 5 Claims



1. A fuel metering control for the carburetor of an internal combustion engine for an automotive vehicle, the carburetor having a housing with at least one main fuel metering jet therein, the flow through which is controlled by a metering rod fixed by a rod carrier to a main power piston reciprocally journalled in a piston bore in the housing responsive to engine manifold vacuum, said fuel metering control including a fluid pressure actuated valve means operable to control manifold vacuum flow to the main power piston, movable stop means operatively positioned to limit axial movement of the power piston in opposite directions, a differential fluid pressure power actuator, linkage means operatively connecting said differential fluid pressure power actuator to said stop means to effect movement of said stop means and, valve controlled conduit means operatively connected to said valve means, to said power actuator and selectively connectable to a source of a first fluid and to a source of a second fluid under pressure greater than the pressure of said first fluid whereby said valve controlled means selectively supplies a first fluid and a second fluid to said valve means and to said power actuator, said valve controlled conduit means being operative as a function of engine operation to control the flow selectively of said first fluid and of said second fluid to said valve means and to said power actuator whereby said fuel metering control will be operative in the carburetor to provide dual fuel mixtures to the engine as a function of engine operating conditions.

3,912,797

LIQUID COOLING APPARATUS AND INSTALLATIONS

Leonard J. Boler, Minneapolis; Bryan J. Beaulieu, Hopkins; Leander J. Stoesz, and Mandel L. Desnick, both of St. Louis Park, all of Minn., assignors to Cherne Industrial, Inc., Edina, Minn.

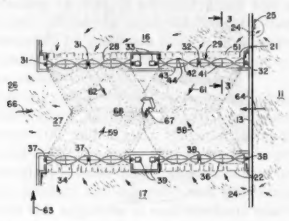
Filed Apr. 10, 1973, Ser. No. 349,782

Int. Cl.² B01F 5/22

U.S. Cl. 261—90 21 Claims

9. A large scale liquid cooling assembly for spraying heated liquid into the ambient atmospheric wind conditions above an open receiving reservoir for cooled liquid comprising a liquid-projecting rotor member, and means for supporting the rotor member for rotation on a generally horizontal axis adjacent such an open reservoir, said rotor member having at least one generally axially extending paddle-like blade portion which has a cross section, as measured in a plane perpendicular to

said axis, which extends generally radially outwardly from said axis and has an outer peripheral liquid-projecting edge, said blade portion having axially spaced cross sections at successively progressing relative radial angles, with such axially spaced cross sections defining an axially helically extending blade portion having an outer edge extending generally spirally around said axis, and liquid feeding means for feeding heated liquid inwardly from a location at the peripheral edge of the blade portion to the angular space swept by the blade portion during successive rotations of the rotor member around said axis, said liquid feeding means including an open-topped liquid supply channel immediately below the rotor member for maintaining a supply of liquid with a surface level only slightly above the lowermost point swept during rotation of the outer peripheral liquid-projecting edge of the blade portion.



15. A liquid cooling assembly comprising a plurality of liquid cooling spray units arranged in generally parallel pairs of rows, with at least two such units in each row, the spray units in each such row of each pair being aligned and oriented to project liquid drops in trajectories which have horizontal components extending outwardly from such row and toward the opposite row of that pair, the spray units at the ends of each such row projecting such drops angularly in trajectories which have horizontal components extending angularly in a direction inclined toward the opposite ends of the opposite row of that pair, with the projected liquid drops providing wind effects drawing air inwardly from the ends of each pair of rows toward a central area between the opposite rows of such pair.

3,912,798
PROCESS FOR PRODUCTION OF FUEL BODIES, FUEL ELEMENTS AND ABSORBER ELEMENTS FOR HIGH TEMPERATURE REACTORS

Lothar Rachor, Kleinauheim, and Gerhard Spener, Hanau, both of Germany, assignors to Hochtemperaturreaktor-Brennelement GmbH, Germany

Filed Sept. 18, 1973, Ser. No. 398,435

Claims priority, application Germany, Sept. 20, 1972, 2246163

Int. Cl. G21c *21/02*

U.S. Cl. 264—.5 **8 Claims**

1. A process for the production of fuel bodies, fuel elements and absorber elements for high temperature reactors comprising isostatic pressing of a mixture of binder containing graphite powder and encased coated member of the group consisting of the group consisting of fuel particles and absorber particles at high compression comprising pressing in a plurality of pressing steps with stepwise increasing compression so that in each pressing step a fixed compression takes place which is free of a vacuum or deaeration step when the material to be pressed is a powdery condition, permitting the air compressed in the pressing process to escape from the porous pressed article without injuring the structure and increasing the pressure employed in successive pressing steps until a final compression, said process including a first pressing step preforming in a rubber mold with a suitable cavity at low pressure, kernels of a homogeneous mixture of encased, coated particles selected from the group consisting of (1) fuel particles (2) absorber particles and (3) binder containing graphite molding powder and embedding said preformed kernels in a coating of binder containing graphite molding powder to form a preformed article by pressing in a second pressing step in a second rubber mold with a suitable cavity at low pressure a mixture of said kernels and binder containing graphite powder, and in a third pressing step, pressing said preformed article at high pressure in another rubber mold having a suitable cavity, and finally performing a subsequent heat treatment.

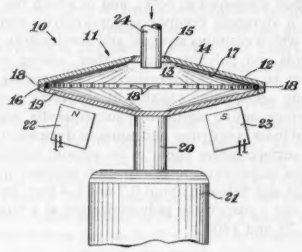
3,912,799
CENTRIFUGAL EXTRUSION EMPLOYING EDDY CURRENTS

Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1973, Ser. No. 406,510

Int. Cl.[2] H05B *9/00*

U.S. Cl. 264—25 **10 Claims**



1. In a method for the centrifugal extrusion of extrudable material comprising rotating an electrically and thermally conductive extrusion die having a plurality of peripherally disposed discharge openings defined therein, the openings being in communication with a generally centrally disposed material receiving cavity, applying to the die a magnetic field, rotating the die and inducing electric current within the die sufficient to cause flow of the material from the discharge openings due to centrifugal force, supplying material to the cavity and heating the material in the die and subsequently discharging the material from the discharge openings, the improvement which comprises

providing a die of at least two generally discoidal parts, the first discoidal part being of a ferromagnetic material, the second part being of an electrically conductive generally non-ferromagnetic material, and

applying the electromagnetic field adjacent the second side of generally non-ferromagnetic material.

3,912,800
METHOD OF PRODUCING POROUS POLYMERIC ARTICLES

Frank E. Edlin, Tempe, Ariz., and Joseph M. Tucker, Jr., Wichita, Kans., assignors to International Plastics, Inc., Colwich, Kans.

Filed Sept. 21, 1970, Ser. No. 74,210The portion of the term of this patent subsequent to Nov. 14, 1975, has been disclaimed.

Int. Cl. B29d *27/00*

U.S. Cl. 264—53 **5 Claims**

1. A method for producing a porous article from polymeric resins selected from the group consisting of polymers of mono-1-olefins, copolymers of mono-1-olefins, polyamids, acrylic, polyethers, halogenated polymers and copolymers, polycarbonate, and polymers of acrylonitrile-butadiene-styrene, which can be fabricated by melt extrusion which consists

essentially of (a) admixing said polymeric resin with from about 0.05 to 25 weight percent of a thermally decomposable chemical compound which will decompose at a temperature below that employed in melt extrusion and wherein said decomposable compound is selected from the group consisting of azo-compounds, and solid compounds which produce carbon dioxide on decomposition; (b) incorporating in and maintaining from about 0.05 to 2 weight percent of an inert liquid in the mixture of step (a), said inert liquid further being characterized as having liquid properties under extrusion conditions but which rapidly changes to a gas where an extrudate formed from said mixture is withdrawn from an extrusion die; (c) introducing said mixture containing said liquid into an extruder; (d) extruding said mixture containing said liquid under temperature and pressure conditions wherein said thermally decomposable chemical compound decomposes, said liquid is maintained in the liquid state while in the extruder, and said liquid in the extrudate issuing from the extruder violently translates to a gaseous state; (e) and withdrawing gaseous products of the decomposition of the decomposable chemical compound and the liquid through the surface of said extrudate by differential pressure while same is in a semimolten state; and (f) recovering a porous article.

3,912,801

SOLVENT EXTRACTION OF METALS WITH A CYCLIC ALKYLENE CARBONATE

Bobby G. Stephens, Spartanburg, S.C., assignor to Wellington M. Manning, Jr., Spartanburg, S.C.

Filed July 11, 1972, Ser. No. 270,686
Int. Cl. B01d *11/00*
U.S. Cl. 423—8 **29 Claims**

1. A process for the solvent extraction of metal values selected from the group consisting of salts and complexes of gold, platinum, palladium, rhodium, iridium, cobalt, copper, vanadium, uranium, bismuth, cadmium, mercury, and cerium, comprising the steps of providing an aqueous medium containing at least one of the said metal values, said medium having an acid pH, and contacting said medium with a composition comprising a cyclic alkylene carbonate, said carbonate composition being at lest partially insoluble in said medium.

3,912,802 RJW

AMMONIUM POLYPHOSPHATES

John F. McCullough, Florence, and Richard C. Sheridan, Sheffield, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 245,753, April 20, 1972, abandoned, which is a continuation of Ser. No. 238,604, March 27, 1972, Pat. No. 904,031, which is a continuation-in-part of Ser. No. 33,492, April 20, 1970, abandoned. This application Dec. 5, 1973, Ser. No. 422,012
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—306 **15 Claims**

1. A process for the manufacture of long-chain crystalline ammonium polyphosphate having the general formula $(NH_4)_mH_{(n-m)+2}P_nO_{3n+1}$, where n is greater than about 50 and where the ratio m/n is in the range from 1.04 to about 0.85; which process consists essentially of the steps of heating relatively short-chain length where n is less than about 4 ammonium phosphates selected from the group consisting of ortho-, pyro-, tripoly-, and mixtures thereof, at about atmospheric pressure and in an atmosphere of ammonia, said atmosphere of ammonia being maintained over the ammonium phosphate material by means of continuously sweeping said area with a gas containing about 10 volume percent to about 100 volume percent of ammonia to a temperature in the range of about 250°C to about 400°C for a period of from about 1 hour to about 16 hours to directly produce, with the requirement of a condensing agent additive supplied thereto solid long-chain where n is greater than about 50 crystalline ammonium polyphosphates; and recovering as the resulting solid product long-chain crystalline ammonium polyphosphates selected from the group consisting of crystalline modification forms I, II, III, IV, V, and mixtures thereof, and containing from about 12.5 to about 14.5 percent N, and from about 69 to about 73 percent P_2O_5 by weight and representing substantially about 100 percent conversion of said relatively short-chain length ammonium polyphosphates to said long-chain crystalline ammonium polyphosphates.

3,912,803

PURIFICATION OF PHOSPHORIC ACID

Thomas Alan Williams, Beckermet, and Frank Michael Cussons, Little Broughton, both of England, assignors to Albright & Wilson Limited, Warley, England

Filed Apr. 23, 1973, Ser. No. 353,850
Claims priority, application United Kingdom, Oct. 2, 1972, 45380/72
Int. Cl.² B01D *9/02, 11/04;* **C01B** *25/22*
U.S. Cl. 423—321 **26 Claims**

1. In a process for purifying wet process phosphoric acid, which comprises mixing the acid with an organic solvent selected from the group consisting of acyclic pentanones, acyclic hexanones, tributyl phosphate, butanols, amyl alcohols, cyclohexanone and dialkyl ethers of two to four carbon atoms in each alkyl group, to produce an organic extract containing phosphoric acid, scrubbing the extract to reduce the impurity content of the extract, and treating the scrubbed extract to prepare a partially purified aqueous phosphoric acid having a metal impurity content of less than 100 ppm, the improvements comprising forming partially purified aqueous phosphoric acid solution having a P_2O_5 concentration of below 67% and at least 61%, and subsequently cooling to bring about the formation of crystals of $H_3PO_4.\frac{1}{2}H_2O$ and a mother liquor at a temperature below 20°C, and separating from the mother liquor, the crystals having a substantially reduced metal impurity content compared to that of the concentrated acid.

3,912,804

RENAL CLEARANCE METHOD EMPLOYING ISOMALTITOL

Hubert Schiweck, Obrigheim, Germany, assignor to Suddeutsche Zucker-Aktiengesellschaft, Mannheim, Germany

Filed Feb. 12, 1974, Ser. No. 441,889
Int. Cl.² A61K *29/00, 31/70;* **G01N** *31/22, 33/16*
U.S. Cl. 424—9 **1 Claim**

1. In the method of providing a renal clearance test wherein a test substance is injected into a patient intravenously and the amount of the test substance passing through the kidneys is measured from the content of the said test substance in the subsequently passed urine, the improvement which comprises administering to said patient as a substitute for inulin normally used as the test substance therein a 5–20 percent solution of isomaltitol in a physiologically acceptable saline solution.

3,912,805

REAGENT AND ASSAY FOR HUMAN FIBRINOGEN DEGRADATION PRODUCTS

Ian Cayzer, Westerham, and Pamela Mary Pitcher, Addington, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 160,500, July 7, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,122
Claims priority, application United Kingdom, July 17, 1970, 34899/70
Int. Cl.² A23J *1/06;* **A61K** *31/74;* **G01N** *31/00, 33/16*
U.S. Cl. 424—12 **10 Claims**

1. An immunological diagnostic reagent suitable for use in the assay of human fibrinogen degradation products, comprising adsorbent inert particles having a diameter of 0.1 to 1 micron sensitised with an antiserum comprising antibodies raised, in a mammal other than man, against at least one of the

two major fragments of said human fibrinogen degradation products;

wherein the fibrinogen degradation products, against which said antibodies are raised, are obtained from the digestion of human fibrinogen or fibrin with a proteolytic enzyme and purification of the composition resulting from the digestion to provide at least one of the two major fragments of said human fibrinogen degradation products.

3,912,806

METHOD OF TREATING BOVINE MASTITIS

John Sydney Dowrick, Littlehampton, and Jeffrey Lewis Marsden, Worthing, both of England, assignors to Beecham Group Limited, England

Filed May 24, 1974, Ser. No. 473,198

Claims priority, application United Kingdom, May 24, 1973, 24915/73

Int. Cl.² A61K *9/16, 9/22, 31/43*

U.S. Cl. 424—16 10 Claims

1. A method for the treatment and control of bovine mastitis which comprises administering to a cow during the dry period, by the intramammary route, an effective amount of an antibacterial agent contained in granules of 5–500 microns in size, which are suspended in an aqueous medium or oily vehicle, said granules including 50–99% of said antibacterial agent and 1–50% of a substantially water-insoluble and oil-insoluble, non-toxic and non-irritant binding agent selected from the group consisting of ethyl cellulose, polyvinyl ester, polyacrylamide, silicone, and shellac.

3,912,807

TREATMENT OF DIABETES USING SOMATOSTATIN AND INSULIN

Harvey E. Alburn, West Chester; Norman H. Grant, Wynnewood, and Donald E. Clark, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,148

Int. Cl.² A61K *37/26, 37/00*

U.S. Cl. 424—178 10 Claims

1. A method for treating diabetes mellitus in a warm-blooded mammal which comprises administering parenterally to said mammal an effective amount of an injectable composition comprising insulin combined in water with at least one of a member of the class consisting of somatostatin, reduced somatostatin, or polymeric reduced somatostatin.

3,912,808

HAIR WAVING AND STRAIGHTENING PROCESS AND COMPOSITION CONTAINING WATER-SOLUBLE AMINO AND QUATERNARY AMMONIUM POLYMERS

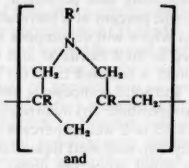
Phillip E. Sokol, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 14,205, Feb. 25, 1970, abandoned. This application June 29, 1972, Ser. No. 267,664

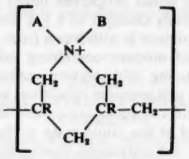
Int. Cl.² A61K *7/09*

U.S. Cl. 424—71 7 Claims

1. A composition for waving or straightening hair containing an aqueous solution of (1) a reducing agent capable of reducing the disulfide linkages in hair keratin and of (2) a water soluble polymer having a molecular weight from 20,000 to 3,000,000 and having a molecular chain containing units selected from the group consisting of



and



wherein R is hydrogen or methyl; R′ is hydrogen, alkyl having one to 22 carbon atoms, lower hydroxyalkyl having from one to five carbon atoms, or lower alkyl containing a terminal amido group; and A and B are independently alkyl having from one to 22 carbon atoms, lower hydroxyalkyl, or lower alkyl containing terminal amido, or wherein A and B taken together with N are piperidinyl or morpholinyl, the amount of said reducing agent being from 0.5 to 10% by weight of the total aqueous composition and the amount of said polymer being from 0.05% to 40% by weight of the total aqueous composition.

3,912,809

DISINFECTING EMBALMING COMPOSITION

Leandro Rendon, Springfield, Ohio, assignor to The Champion Company, Springfield, Ohio

Filed June 3, 1974, Ser. No. 475,650

Int. Cl.² A01N *1/00*

U.S. Cl. 424—75 6 Claims

1. A disinfecting embalming composition comprising a mixture of glutaraldehyde solution and an alkalinating solution wherein the mixture contains approximately 2% by weight glutaraldehyde, approximately 2.0 to 3.0% by weight formaldehyde and approximately 4 ounces of alkalinating solution, and wherein said glutaraldehyde and said alkalinating solutions are comprised of the following:

Glutaraldehyde Solution

	Parts by Weight
Glutaraldehyde	8–12
Formaldehyde	8–25
Alcohol	15–26
Water	27–42
Glycerin	6–12
Alkyl aryl sodium sulfonate	0.5–1.0
Tetra hydrofurfuryl alcohol	0–10
Coloring agents	0–0.05
Essential Oils (Re-odorants)	0–1.0

Alkalinating Solution

	Percent by Weight
Ethylene diamine tetraacetate [tetraacentate]	25.0
Sodium Citrate or Phosphate	5.0
Water	65.0–70.0
Total	100%

said alcohol being selected from the group consisting of methanol, isopropanol and mannitol.

3,912,810
ATTRACTANTS FOR YELLOW JACKETS (VESPULA SPP.: VESPIDAE)

Gaines W. Eddy, Mission, Tex.; Harry G. Davis, Fresno, Calif.; Morton Beroza, Silver Spring, and Terence P. McGovern, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 246,024, April 20, 1972, abandoned, which is a division of Ser. No. 857,611, June 27, 1969, abandoned, which is a division of Ser. No. 623,154, Dec. 29, 1966, Pat. No. 3,485,868. This application Oct. 19, 1973, Ser. No. 408,036

Int. Cl.² A01N *17/14, 9/24*

U.S. Cl. 424—84 **7 Claims**

1. A method of attracting yellowjacket wasps (Vespula spp) comprising exposing said wasps to an effective attractant amount of an ester having an alcohol moiety and an acid moiety and having a chain length of from 10 to 12 carbon atoms, said alcohol moiety being derived from a saturated aliphatic hydrocarbon alcohol containing from five to six carbon atoms and said acid moiety being derived from an acid selected from the group consisting of alkenoic and alkynoic acids each containing from four to seven carbon atoms.

3,912,811
ANTIBIOTIC PHOLIPOMYCIN AND ITS PREPARATION

Mamoru Arai; Akio Torikata; Hisayoshi Fukatsu; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,514

Claims priority, application Japan, June 30, 1973, 48-73807

Int. Cl.² A61K *35/00*

U.S. Cl. 424—118 **3 Claims**

1. An antibiotic substance named pholipomycin of an acidic white powder in a pure form, containing the following elements in the following proportion: C: 50.15 %, H: 7.14 %, N: 4.48 %, P: 2.33 %; having an empirical formula $C_{50-65}H_{85-111}N_{5-6}O_{25-35}P$, a molecular weight of 5100 by gell filtration, a melting point of 250°C. (with decomposition), a specific rotation in water of +6.0° at 20°C, ultraviolet absorption spectrum maxima at 257 μ (H_2O), 245 μ (0.1 N HCl) and 258 μ (0.1N NaOH)

$E_{1\,cm}^{1\,\%} = 142$ (H_2O), 93 (0.1N HCl) and 144 (0.1N HCl), a pka of 4.37, the folllowing distinguishable bands in an infra-red absorption spectrum (in KBr) of 3500, 2980, **1740**, 1650, 1565, 1410, 1390, 1340, 1240, 1080, 1050, 975, 950, 890, 860, 825, 805, 760, 670 cm^{-1}; being easily soluble in water, soluble in methanol and n-butanol, sparingly soluble in acetone, chloroform and ether; positive for Tollens reaction, false positive for Elson-Morgan reaction, negative for ninhydrin, Benedict, biuret, Bial, ferric chloride and anthrone reactions and stable at pH 4–10; and having Rf values of 0.74 and 0.25 in cellulose and silica gel thin-layer chromatographies in n-propanol-2NNH$_4$OH (7:3).

3,912,812
CERTAIN PYRIMIDINE DERIVATIVES AS INSECTICIDES AND FUNGICIDES

Francis Leslie Charles Baranyovits, and Ian Trevor Kay, both of Wokingham, England, assignors to Imperial Chemical Industries Limited, London, England

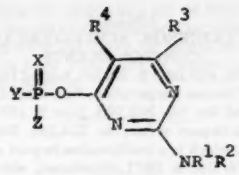
Division of Ser. No. 247,353, April 25, 1972, Pat. No. 3,843,655. This application June 10, 1974, Ser. No. 478,066

Claims priority, application United Kingdom, May 6, 1971, 13477/71; Aug. 9, 1971, 37298/71; Oct. 5, 1971, 46229/71; Dec. 15, 1971, 58224/71

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 **6 Claims**

1. An insecticidal and fungicidal composition comprising a diluent and as an active ingredient an insecticidally and fungicidally effective amount of a compound of the formula:



wherein X is oxygen or sulphur; Y and Z, which may be the same or different, are alkoxy containing up to six carbon atoms; R^3 and R^4, which may be the same or different, are hydrogen or alkyl containing up to six carbon atoms; R^1 is alkyl containing up to six carbon atoms; and R^2 is a group R^5CO— where R^5 is hydrogen, alkyl containing up to six carbon atoms, alkoxy containing up to six carbon atoms or alkyl-substituted amino containing up to six carbon atoms.

3,912,813
NEMATOCIDAL SOIL TREATING COMPOSITIONS COMPRISING 1,2-DIBROMO-3-CHLOROPROPANE AND O-PHENYL N,N'-DIMETHYL PHOSPHORODIAMIDATE

Cleve A. I. Goring, Walnut Creek, and Charles R. Youngson, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 400,093, Sept. 24, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,471

Int. Cl.² A01N *9/30, 9/36*

U.S. Cl. 424—220 **5 Claims**

1. A synergistic nematocidal composition for use in soil for the control of plant root attacking nematodes which comprises a mixture of toxicants consisting of about 1 part by weight of O-phenyl N,N'-dimethyl phosphorodiamidate and from about 1 to about 9 parts by weight of 1,2-dibromo-3-chloropropane, said mixture being in intimate admixture with an inert carrier therefor in an amount of from about 0.00001 to 90 percent by weight of the total composition.

3,912,814
FUNGICIDE COMPOSITIONS CONTAINING 2,4-DICHLORO-6-O-CHLOROANILINO-S-TRIAZINE

Fred Eugene Ferguson, and Robert J. Bell, bothr of Marysville, Ohio, assignors to O. M. Scott and Sons Company, Marysville, Ohio

Continuation of Ser. No. 299,950, Oct. 24, 1972, abandoned. This application June 3, 1974, Ser. No. 475,882

Int. Cl.² A01N *9/00, 9/22, 9/24*

U.S. Cl. 424—249 **15 Claims**

1. A fungicidal composition in granular form comprisong a mixture of

a. from 1,100 to 1,200 grams of 2,4-dichloro-6-o-chloroanilino-s-triazine,

b. from about 50 to 900 milliliters of a sticking agent,

c. from about 700 to 2,000 milliliters of octyl phenoxy polyethoxy ethanol, having 9 to 10 oxyethylene groups, and

d. a particulate carrier.

3,912,815
CERTAIN 2,4-DIENOIC ACID ESTERS AS INSECT CONTROL AGENTS

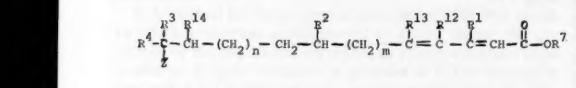
Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 263,903, June 9, 1972, and a continuation-in-part of Ser. No. 224,261, Feb. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 206,174, Dec. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411, which is a continuation-in-part of Ser. Nos. 111,650, Feb. 1, 1971, Pat. No. 3,729,486, and Ser. No. 111,702, Feb. 1, 1971, abandoned, and Ser. No. 111,765, Feb. 1, 1971, abandoned, and Ser. No. 111,766, Feb. 1, 1971, abandoned, and Ser. No. 111,770, Feb. 1, 1971, abandoned, and Ser. No. 115,725, Feb. 16, 1971, Pat. No. 3,706,733. This application Jan. 28, 1974, Ser. No. 437,438

Int. Cl.² A01N *9/24*

U.S. Cl. 424—312 **16 Claims**

1. A composition for the control of insects which comprises a suitable carrier substance and a compound of the following formula:



wherein,

each of *m* and *n* is zero or the positive integer one, two or three;

Z is bromo, chloro, fluoro or the group -OR in which R is hydrogen, lower alkyl of one to six carbon atoms or hydrocarbon carboxylic acyl of one to three carbon atoms; each of R^1 and R^2 is methyl or ethyl;

R^3 is hydrogen, methyl or ethyl;

R^4 is lower alkyl of one to six carbon atoms;

each of R^{12}, R^{13}, and R^{14} is hydrogen or methyl; and

R^7 is lower alkyl of one to six carbon atoms, lower alkenyl of two to six carbon atoms, lower alkynyl of three to six carbon atoms, cycloalkyl of three to eight carbon atoms, aryl of six to twelve carbon atoms or aralkyl of seven to twelve carbon atoms,

said compound being present in the composition in an amount sufficient to inhibit normal development of the insect.

3,912,816
CERTAIN BACTERICIDAL TRIAMINE

Eberhard Hofmann, Essen-Bredeney, and Ulrich Holtschmidt, Essen, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Continuation of Ser. No. 107,443, Jan. 18, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 393,187

Claims priority, application Germany, Feb. 27, 1970, 2009276

Int. Cl.² A01N *9/20*

U.S. Cl. 424—325 **5 Claims**

1. A method of inhibiting the growth of bacteria, which comprises applying to the locus to be protected a bactericidal composition consisting essentially of a bactericidally effective amount of the compound N-dioctyl-diethylenetriamine and an acid in an amount sufficient to impart to the composition a pH value of between about 5 – 8, and an inert carrier.

3,912,817
GUM PRODUCT AND METHOD OF MAKING THE SAME

Melvin L. Sapsowitz, Clarks Summit, Pa., assignor to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 403,152, Oct. 3, 1973, Pat. No. 3,862,338, which is a continuation-in-part of Ser. No. 170,634, Aug. 10, 1971, abandoned. This application Jan. 13, 1975, Ser. No. 540,530The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² A23G *3/30*

U.S. Cl. 426—5 **4 Claims**

1. The method of making an improved chewing gum product which comprises mixing gum base in an amount not less than about 12% by weight, flavoring, and an added sugar component, said mixture being characterized by a total free water content in the range of from about 4 to about 8% by weight and being capable of being melted to a viscosity under about one million cps by being heated to a temperature in the range of from about 60°C to about 80°C, heating said gum mixture to a temperature range of from about 60°C to about 80°C to reduce the viscosity of said mixture to a value below about one million cps, thereafter forming said mixture into a desired finished shape while in a liquid phase and, thereafter cooling said shaped gum and permitting the same to age, thereby producing a shaped chewing gum having a relatively impervious fine grained yieldable surface skin surrounding a nougat-like interior.

3,912,818
PROCESS FOR PRODUCING MODIFIED PROTEIN

Keith L. Chandler, Barrington; Roy G. Hyldon, Crystal Lake, and John P. O'Mahony, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,753

Int. Cl.² A23J *3/00*; A23L *1/36*

U.S. Cl. 426—44 **10 Claims**

1. A process for producing a modified vegetable protein having properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a carbohydrate containing vegetable protein material, said vegetable protein material containing at least about 30 percent by weight protein;

B. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33°F. to 90°F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergenis;*

C. reacting the carbon dioxide with an alkali metal hydroxide or ammonium hydroxide to form a carbonate, said hydroxide being added in an amount sufficient to adjust the pH of the carbonate containing slurry to from about 7.0 to about 10.5 said hydroxide being reacted with the carbon dioxide while in slurry;

D. heating the aqueous slurry to react the carbonate with the protein said reacting occurring after the carbonate is created in situ;

E. neutralizing the slurry to a pH of from about 6.6 to 7.0 by addition thereto of an edible acid or edible alkali; and

F. drying the neutralized slurry to remove a substantial portion of the water therein.

3,912,819
PROCESS FOR THE PRODUCTION OF A CASEIN SUBSTITUTE

Keith L. Chandler, Barrington; Roy G. Hyldon, Crystal Lake, and John P. O'Mahony, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,760
Int. Cl.² A23J *3/00*; A23L *1/36*
U.S. Cl. 426—44 **10 Claims**

1. A process for producing a proteinaceous mixture of modified vegetable protein and unmodified protein, said mixture having properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a carbohydrate containing vegetable protein material, said vegetable protein material containing at least about 30 percent by weight protein;

B. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33°F. to 90°F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeasts Saccharomyces cerevisiae and Saccharomyces carlsbergensis;

C. adding an alkali metal hydroxide or ammonium hydroxide to the slurry in an amount sufficient to form a carbonate and to adjust the pH of the carbonate containing slurry to from about 7.0 to about 10.5;

D. heating the aqueous slurry to react the carbonate with the protein;

E. neutralizing the slurry to a pH of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali;

F. drying the neutralized slurry to remove a substantial portion of the water therein; and

G. admixing from 1–15 parts by weight of the dried neutralized slurry with from 1–30 parts by weight unmodified proteinaceous material.

3,912,820
PROCESS FOR THE PRODUCTION OF A CASEIN SUBSTITUTE

Keith L. Chandler, 807 Grove Ave., Barrington, Ill. 60010; Roy G. Hyldon, 177 Marion Parkway, Crystal Lake, Ill. 60014, and John P. O'Mahony, 103 E. Lake Shore Drive, Barrington, Ill. 60010

Filed June 12, 1974, Ser. No. 478,762
Int. Cl.² A23J *3/00*; A23L *1/36*
U.S. Cl. 426—44 **12 Claims**

1. A process for producing a proteinaceous mixture of modified vegetable protein and unmodified protein, said mixture having properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a carbohydrate containing vegetable protein material, said vegetable protein material containing at least about 30 percent by weight protein;

B. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33°F. to 90°F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*

C. reacting the carbon dioxide with an alkali metal hydroxide or ammonium hydroxide to form a carbonate, said hydroxide being added in an amount sufficient to adjust the pH of the carbonate containing slurry to from about 7.0 to about 10.5 said hydroxide being reacted with the carbon dioxide while in slurry;

D. heating the aqueous slurry to react the carbonate with the protein said reacting occurring after the carbonate is created in situ;

E. neutralizing the slurry to a pH of from 6.0 to 8.0 by addition thereto of an edible acid or edible alkali; and

F. admixing from 1–15 parts by weight of the neutralized slurry with from 1–30 parts by weight unmodified proteinaceous material.

3,912,821
PROCESS FOR PRODUCING LIQUID MODIFIED PROTEIN

Keith L. Chandler, Barrington; Roy G. Hyldon, Crystal Lake, and John P. O'Mahony, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,887
Int. Cl.² A23J *3/00*; A23L *1/36*
U.S. Cl. 426—44 **10 Claims**

1. A process for producing a modified vegetable protein having properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a carbohydrate containing vegetable protein material, said vegetable protein material containing at least about 30 percent by weight protein;

B. fermenting the slurry with yeast to generate carbon dioxide, said fermentation being conducted at a temperature of from 33°F. to 90°F. for from 4 hours to 96 hours, and said yeast comprising a member selected from the group of yeast *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis;*

C. reacting the carbon dioxide with an alkali metal hydroxide or ammonium hydroxide to form a carbonate, said hydroxide being added in an amount sufficient to adjust the pH of the carbonate containing slurry to from about 7.0 to about 10.5 said hydroxide being reacted with the carbon dioxide while in slurry;

D. heating the aqueous slurry to react the carbonate with the protein said reacting occurring after the carbonate is created in situ;

E. adjusting the pH of the slurry to a pH of from about 6.6 to 7.0 by addition thereto of an edible acid or edible alkali.

3,912,822
PROCESS FOR PRODUCING A PROTEIN HYDROLYSATE

Tamotsu Yokotsuka, Nagareyama; Takashi Iwaasa, and Mitsuharu Fujii, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Japan

Division of Ser. No. 345,455, March 27, 1973, Pat. No. 3,852,479, which is a continuation-in-part of Ser. No. 102,878, Dec. 30, 1970, abandoned. This application July 24, 1974, Ser. No. 491,487
Int. Cl.² A23L *1/36*
U.S. Cl. 426—44 **1 Claim**

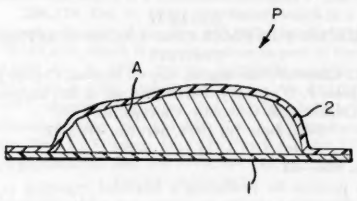
1. A process for producing a protein hydrolysate having a high glutamic acid content, which consists essentially of a one step process of adding a salt-resistant glutaminase produced by culturing at least one microorganism capable of producing a salt-resistant glutaminase selected from the group consisting of *Escherichia coli* B IAM 1268 (ATCC 11303), *Proteus vulgaris* IAM 1025, *Archromobacter liquefaciens* TR-9, *Bacterium succinicum* IAM 1017, *Pseudomonas fluorescens* IAM 1179, *Pseudomonas ovalis* R 962, *Pseudomonas schuylkilliensis* IAM 1154 NRRL B-6, *Bacillus megaterium* NRRL B-939, *Cryptococcus albidus* ATCC 20293, *Cryptococcus albidus* ATCC 20294 together with a proteolytic enzyme to a protein-containing raw material, or adding a salt-resistant glutaminase produced as above to a protein-containing raw material in the presence of a proteolytic enzyme, and both initiating and continuing the hydrolysis of the protein contained in the raw material in the presence of at least 10 percent of sodium chloride.

3,912,823

VACUUM SKIN-PACKAGE FOR COOKING FOOD

William Paul Kane, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1973, Ser. No. 335,118
Int. Cl.[2] B65B 29/08
U.S. Cl. 426—129 1 Claim



1. A vacuum skin-package suitable for cooking at temperatures of up to about 400°F. which comprises:

a lower package member of polyethylene terephthalate-azelate film, such film being stretch-oriented and heat-set and in substantially flat form in the package;

a thermoformable upper package member of polyethylene terephthalate film having a degree of crystallinity of less than 5%;

a food product positioned between the upper and lower package members in a substantially air-free state with the upper package member being in skin-tight engagement with the food product; and

said upper package member heat sealed directly to the lower package member without the use of adhesives, thereby forming a heatsealed, vacuum skin-package.

3,912,824

HIGH-PROTEIN QUICK COOKING MEAT-LIKE FOOD MADE FROM PLANT PROTEIN MATERIALS

Albert Spiel, Yonkers, N.Y., assignor to Harold A. Hoffman, New Rochelle, N.Y.

Division of Ser. No. 275,957, July 28, 1972, which is a continuation-in-part of Ser. No. 218,117, Jan. 17, 1972. This application July 3, 1974, Ser. No. 485,616
Int. Cl.[2] A23J 3/00; A23K 1/14; A23L 1/20
U.S. Cl. 426—630 25 Claims

1. A method of preparing a quick-cooking protein food product, which comprises palatable, meat-like in texture, bland, chewable chunks when hydrated, comprising the steps of:

a. subjecting proteinaceous feed selected from the class consisting of solvent-extracted meal, grits, and flakes of a proteinaceous vegetable material having an NSI of about 30 to about 70 and containing moisture, to a mechanical pressure of at least 1,800 pounds per square inch for a time and at a temperature sufficient to convert said moisture into steam whereby said proteinaceous feed is partially disembittered, toasted without scorching, and is compacted into a hard and substantially fused mass;

b. fragmenting the mass into chunks;

c. heating the chunks at atmospheric pressure in hot water at a pH of about 5 to about 10 for a period of time selected in accordance with the mean size of the chunks, and sufficient in length to substantially hydrate the chunks and to dissolve out soluble constituents whereby the chunks are softened to a chewable consistency;

d. separating the chunks from said water containing said dissolved out soluble constituents; and

e. drying the chunks, whereby chunks are obtained which are cohesive, porous, bland, storable, appetizing in appearance, high in protein and quick and easy to cook or prepare for consumption and which are chewable, light-colored, meat-like in texture, bland and palatable when hydrated.

3,912,825

EDIBLE FUNGAL PROTEIN FROM NON-TOXIC PENICILLIUM

Arnold Spicer, Iver Heath, and Gerald L. Solomons, High Wycombe, both of England, assignors to Ranks Hovis McDougall Limited, London, England

Division of Ser. No. 333,788, Feb. 20, 1973, Pat. No. 3,865,951, which is a continuation-in-part of Ser. No. 116,684, Feb. 18, 1971, abandoned. This application June 24, 1974, Ser. No. 482,134
Claims priority, application United Kingdom, Feb. 25, 1970, 8977/70; Feb. 25, 1970, 8978/70. The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.[2] A23J 1/00
U.S. Cl. 426—656 1 Claim

1. A nonviable penicillin free fungal mycelium fermentation product possessing a high net protein utilization value on rat assays of at least 70 based on the α-amino nitrogen, characterized by being penicillin free during its growth and containing a non-toxic strain of *Penicillium notatum* or *Penicillium chrysogenum*.

3,912,826

METHOD OF PHYSICAL VAPOR DEPOSITION

Kurt D. Kennedy, Berkeley, Calif., assignor to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 282,388, Aug. 21, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 432,874
Int. Cl.[2] C23C 13/02, 13/04
U.S. Cl. 427—8 4 Claims

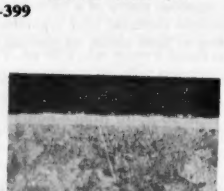
1. A method of physical vapor deposition for depositing material on a substrate, comprising, placing a source of evaporant material and a substrate in a vacuum chamber, maintaining an ambient pressure in the vacuum chamber of less than 10^{-4} Torr, heating the evaporant material by means of an electron beam to produce a vapor for deposition on the substrate and intercepting the vapor with the beam of electrons to produce positive ions, and applying an electrical potential to the substrate sufficient to cause ion bombardment of the substrate at a power density of at least about 6 watts per square inch of exposed substrate surface and maintain the substrate at an equilibrium temperature which is at least 25% of the absolute melting temperature of the evaporant.

3,912,827

METHOD FOR FORMING A CHROMIUM CARBIDE LAYER ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoake; Tohru Arai, Nagoya; Yoshihiko Sugimoto, Nagoya, and Masayoshi Mizutani, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Hisakata, Japan

Filed Nov. 13, 1973, Ser. No. 415,394
Claims priority, application Japan, Nov. 16, 1972, 47-114288; Apr. 12, 1973, 48-040823
Int. Cl.[2] C23C 1/10
U.S. Cl. 427—399 9 Claims



(X 400)

1. In a method for forming a chromium carbide layer on the surface of an iron, ferrous alloy or sintered tungsten carbide containing cobalt article, the surfaces of which articles contain at least 0.06 percent by weight of carbon, which com-

prises preparing a molten treating bath consisting essentially of boric acid or a borate and metallic chromium dissolved therein,

immersing said article into said molten treating bath,

maintaining said article in said molten treating bath to form the chromium carbide layer on the surface of said article, and

removing said article from said molten treating bath, the improvement wherein said molten treating bath is prepared by the method which comprises,

heating a boric acid or a borate selected from the group consisting of sodium borate and potassium borate to its molten state to form a molten bath,

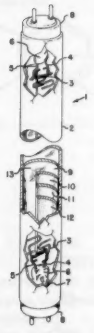
dipping a metal block of chromium or a chromium alloy containing not greater than 10 percent by weight of Ti, Zr, Hf, Mn, Si, Al, Mg, Ca or the rare earth elements which reduce boric acid or borate to metallic form into the molten bath and applying an electric current to the molten bath through said metal block as anode and an electric conductive material, which is in contact with the molten bath, as cathode to anodically dissolve said metal block.

3,912,828

PRECOAT FOR REPROGRAPHIC LAMPS HAVING OXIDE REFLECTOR COATINGS

Ronald J. Olwert, Willoughby, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1973, Ser. No. 405,031
Int. Cl.² H01J *1/62;* **B05D** *5/06, 5/12*
U.S. Cl. 427—67 **6 Claims**



1. A method of treating the inner surface of a glass bulb for use in an apertured fluorescent reprographic lamp having an oxide reflector coating comprising the steps of coating said inner surface with a mixture containing tetrabutyl titanate, aluminum-s-butoxide, and magnesium acetate, combined with tri-n-butyl antimonate and/or tri-n-butyl borate, along with solvent and binder materials, and heating said coated bulb to a temperature of about 500°C or greater to cause said mixture to chemically react with said glass.

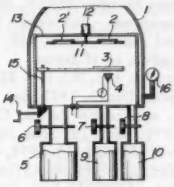
3,912,829

METHOD FOR PRODUCING A POROUS TARGET FOR AN ELECTRON TUBE

Masahiko Takahashi, and Eikyu Hiruma, both of Komae, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 13, 1974, Ser. No. 469,433
Claims priority, application Japan, May 16, 1973, 48-53501
Int. Cl.² B05D *5/12*
U.S. Cl. 427—78 **6 Claims**

1. A method for producing a magnesium oxide porous target, which comprises burning metallic magnesium under an atmosphere of a mixed gas of gaseous oxygen and an inert gas in which magnesium oxide is stable to form magnesium oxide smoke, the total pressure of said mixed gas being 0.5–200 Torr and the partial pressure of oxygen being 0.5–50 Torr, and



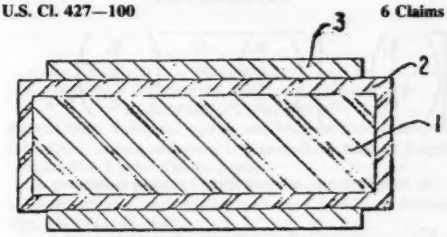
depositing the resulting magnesium oxide smoke on a conductive surface of a supporting film comprising aluminum and aluminum oxide for the target to form a magnesium oxide porous film.

3,912,830

METHOD OF PRODUCING A PIEZOELECTRIC OR PYROELECTRIC ELEMENT

Naohiro Murayama, and Takao Oikawa, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Nihonbashi, Japan

Division of Ser. No. 296,490, Oct. 10, 1972, abandoned. This application Jan. 18, 1974, Ser. No. 434,732
Claims priority, application Japan, Oct. 13, 1971, 46-80184
Int. Cl.² B44D *1/18*
U.S. Cl. 427—100 **6 Claims**



1. A method for producing a piezoelectric or pyroelectric element which comprises:

a. coating the surface of a polar fluorinated polymer film capable of being provided with piezoelectricity and pyroelectricity by a polarization treatment with a high molecular weight thermosetting or thermoplastic resin capable of being provided negligible piezoelectricity or pyroelectricity by polarization treatment,

b. forming on the coating of said high molecular weight resin thin electrodes of a conductive material selected from the group consisting of metal and carbon by vacuum-coating and

c. subjecting the polymer film to a polarization treatment using the coatings of the conductive material as the polarization electrodes.

4. A method for producing a piezoelectric or pyroelectric element which comprises:

a. coating the surface of a polar fluorinated polymer film capable of being provided with peizoelectricity and pyroelectricity by a polarization treatment with a high molecular weight thermosetting or thermoplastic resin capable of being provided with negligible piezoelectricity or pyroelectricity by polarization treatment,

b. forming on the coating of said high molecular weight resin thin electrodes of a conductive material selecred from the group consisting of metal and carbon by plating, and

c. subjecting the polymer film to a polarization treatment using the coatings of the conductive material as the polarization electrodes.

3,912,831

RECORDING MATERIAL

Masao Kan, 1-59, 1-Chome, Matsugaoka, Chigasaki, Kanagawa; Hirokazu Ishii, 790-1, Okamoto, Kamakura, Kanagawa; Yasuzo Murata, 2135-5, Ninomiya, Ninomiya, Naka-Gun, Kanagawa; Takayuki Maruya, 37-12, Hanamizudai, and Akio Yamada, 855, Shinomiya, both of Hiratsuka, Kanagawa, all of Japan

Continuation of Ser. No. 191,783, Oct. 22, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 420,884

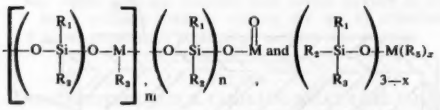
Claims priority, application Japan, Oct. 24, 1970, 45-93757; Apr. 9, 1971, 46-5718; June 30, 1971, 46-48352; Sept. 13, 1971, 46-71359; Oct. 20, 1971, 46-83032; Sept. 28, 1971, 46-76135; Oct. 22, 1971, 46-83716

Int. Cl.[2] B41M 5/02, 5/12

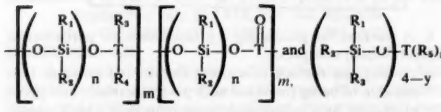
U.S. Cl. 427—145 16 Claims

1. A recording material for recording visual information comprising two colorformer compositions the first having one or more metallosilane compounds therein selected from the group of metallosilanes having the formula A – D (below) and the other colorformer composition containing at least one polyhydroxyphenol compound selected from the group of polyhydroxyphenols having the general formulae E – H (below); said metallosilane compound composition and polyhydroxyphenol composition being physically separated one from the other prior to visual image formation and forming colored compounds by chemical reaction of the metallosilane with the polyhydroxyphenol upon physical mixing of the two compositions

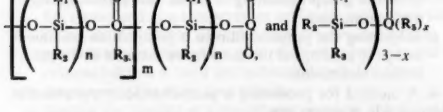
A. metallosilanes selected from the group consisting of:



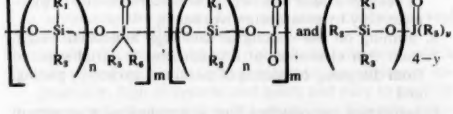
B. metallosilanes selected from the group consisting of:



C. metallosilanes selected from the group consisting of:



D. metalosilanes selected from the group consisting of:



Wherein R_1, R_2, R_3 and R_4 are -OH, $-O_{1/2}$, an alkyl or an aryl radical;

R_5 and R_6 are an anion of an organic or inorganic acid, oxygen or a ligand

M is a trivalent metal

T is a tetravalent metal

Q is a pentavalent metal

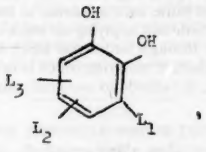
J is a hexavalent metal

m and n each are a number from 1 to 30

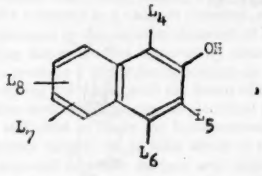
x is 0, 1 or 2

y is 0, 1, 2, 3

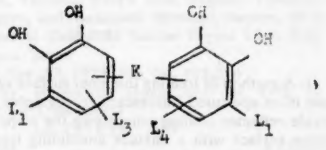
(E)



(F)

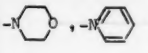


(G)

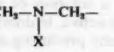


(H)

Wherein each of L_1, L_4 and L_8 are individually selected from the group consisting of H, —OH, alkyl, aryl or acyl radicals with either L_4 or L_8 being H; and L_2, L_3, L_6, L_7, and L_9 are individually selected from the group consisting of H, —OH, —CHO, $—NO_2$, NH_2, alkyl, aryl, acyl, $—SO_3M$ (M is selected from the group of alkali and alkaline earth cations and primary to quaternary amines,), a COY (Y is selected from the group of H, alkyl radicals aryl radicals, and primary to quarternary amines) sulfonic acid amide, amine sulfonate, carboxylic acid amide, amine carbonate,

$-CH_2Z$ (Z is  , -NHCOX,

(X is alkyl, or aryl, A and B are H, alkyl, or aryl radicals); and K is selected from the group consisting of —, —O—, $—SO_2—$ —N=N—, $—(CH_2)_x—$(x is an integer of 1 to 10), and



(X is H, alkyl, or aryl radicals).

3,912,832

OXIDATION RESISTANT COATED CARBON ARTICLES

Tadashi Araki; Kiro Asano, both of Tokyo, and Junichi Kosugi, Urawa, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 166,118, July 26, 1971, Pat. No. 3,791,847. This application Mar. 15, 1973, Ser. No. 341,739

Claims priority, application France, Dec. 22, 1972, 72.46028

Int. Cl.² B05D *3/02*

U.S. Cl. 427—226 **10 Claims**

1. A process for producing a phosphorus-containing carbon coating on a carbon substrate comprising:

vaporizing a phosphorus-containing organic compound or a mixture of a phosphorous compound and an organic compound, said organic or phosphorus-containing organic compound capable of undergoing vapor phase pyrolysis to form a first atmosphere;

heating the substrate in said first atmosphere to a first temperature of 600° to 1,500°C so as to effect vapor phase pyrolysis of said organic compound or phosphorus-containing organic compound, thereby forming a carbon coating on said substrate containing 1–20% by weight of phosphorus; and

heating said coated carbon article in a second nonoxidizing atmosphere at a second temperature of 1,500° to 2,000°C for 0.2 seconds to 30 minutes, said second temperature being higher than said first temperature.

3,912,833

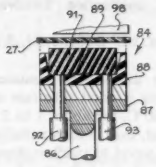
FILM PROCESSING APPARATUS AND METHOD FOR INFORMATION STORAGE SYSTEM

Charles J. Becker, San Jose, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.

Filed June 27, 1973, Ser. No. 373,986

Int. Cl.² B05D *1/26, 1/28;* **G03D** *5/00;* **G03B** *27/02*

U.S. Cl. 427—294 **6 Claims**



1. A method of activating a receiving film comprising the steps of compressing a sponge-like, absorbent, resilient pad against the receiving film, filling said pad with activator fluid to imbibe a segment of said receiving film while maintaining said pad compressed against said receiving film, drawing off the activator and drying out said pad via a vacuum applied to said pad while said pad remains compressed, and retracting the activator-free pad from said receiving film to sponge off any remaining excess drop of activator carried by said receiving film.

3,912,834

PROCESS FOR PRODUCING A SELECTIVELY PERMEABLE COMPOSITE

Satoshi Imai; Tamiyuki Eguchi, and Masaaki Shimokawa, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1973, Ser. No. 361,557

Claims priority, application Japan, June 5, 1972, 47-56266; Jan. 20, 1973, 48-9085

Int. Cl.² B01D *13/06;* **D06M** *15/32, 13/54*

U.S. Cl. 427—316 **20 Claims**

1. In a process for preparing a selectively permeable, asymmetric, composite membrane by impregnating a porous, textile fabric backing material with a nonsolvent for a film-forming polymer, applying a solution of said film-forming polymer in a solvent which is inert to said backing material onto said backing material and gelling the film-forming polymer to form said membrane, the improvement which comprises:

applying a solution of said film-forming polymer onto a surface of said backing material which is substantially free of said nonsolvent while the remainder of said backing material is impregnated with said nonsolvent.

3,912,835

PROCESS OF REINFORCING PAPER

Takeshi Uchida, Toyonaka, Japan, assignor to Nichimen Co., Ltd., Japan

Filed Sept. 20, 1973, Ser. No. 399,078

Int. Cl.² C08F *33/02;* **D21H** *3/40, 3/80*

U.S. Cl. 427—316 **1 Claim**

1. A process of reinforcing paper comprising the steps of drying paper to a moisture content of less than 5%, dipping said paper for about 1 second to about 20 seconds in a solution made by dissolving between about 1 and about 20% by weight of a resin selected from the group consisting of polystyrene, acrylonitrile-styrene copolymer, acrylic resin and acrylonitrile-butadiene-styrene resin in a hydrocarbon halo-

genide solvent, and thereafter drying said paper to obtain a reinforced paper.

3,912,836

PROCEDURE FOR SURFACE TREATMENT OF WOOD

Karl Ingvar Georg Johansson, Spanga, Sweden, assignor to Erik Gustav Lennart Eriksson, Valberg, Sweden

Continuation-in-part of Ser. No. 351,161, April 16, 1973, abandoned. This application Apr. 25, 1973, Ser. No. 354,446

Claims priority, application Sweden, Apr. 27, 1972, 5623/72

Int. Cl.² B05D 3/04, 3/10

U.S. Cl. 427—341 5 Claims

1. A process for the surface-treatment of wood, which comprises pretreating a wood substrate at a temperature between about 60°–100°C. for about 1 to 2 hours with a hydrophilic liquid material, that is substantially free of any solvent and that causes the wood to swell or dissolves constituents of the wood, until the desired depth of penetration has been attained; said hydrophilic liquid material consisting of a condensable solution of formaldehyde in phenol in the weight ratio of about 1:1.8; and thereafter at a temperature between about 50°and about 150°C. treating the resulting pretreated wood with a condensing agent for a time sufficient to obtain a hardened condensate of said hydrophilic material in the form of an abrasion resistant surface.

3,912,837

METHOD OF STABILIZATION OF LIGNOCELLULOSE MATERIALS

Miroslav Pesek, Pardubice, and Frantisek Hrabak, Prague, both of Czechoslovakia, assignors to Ustav pro vyzkum, vyrobu a vyuziti radiosotopu, Prague, Czechoslovakia

Filed Apr. 2, 1973, Ser. No. 346,762

Claims priority, application Czechoslovakia, Mar. 31, 1972, 2188/72

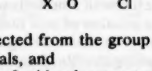
Int. Cl.² B05D 3/02

U.S. Cl. 427—393 8 Claims

1. Method for the stabilization of wood and derivatives thereof which comprises the steps of

a. impregnating said wood or derivative thereof with at least one member selected from the group consisting of

1. an ester having the general formula



wherein X is selected from the group consisting of hydrogen and methyl radicals, and

2. a mixture of said at least one member with an unsaturated monomer selected from the group consisting of vinyl and diene compounds, said mixture containing at least 89%, by volume, ester, and

b. polymerizing the resultant impregnated composition.

3,912,838

PNEUMATIC APPLICATION OF LIGHTWEIGHT CEMENTITIOUS COMPOSITIONS

John Walter Kraus, Glenwood; Preston Leonard Veltman, Severna Park, and Casimer Claudius Legal, Elkridge, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed July 25, 1973, Ser. No. 382,612

Int. Cl.² B05D 1/34, 1/36

U.S. Cl. 427—426 3 Claims

1. A method for applying lightweight cementitious compositions to a surface comprising the steps of:

a. blending and pre-granulating portland cement and vermiculite in a volume ratio of from 1:3 to about 1:20 with a portion of the total water needed for hydration, which constitutes from 0.5 to 1.0 gallons of water per cubic foot of vermiculite, to form damp and relatively dry granules;

b. pneumatically conveying the pre-granulated blend to an application spray nozzle;

c. adding the remaining portion of the total water needed for hydration to the granules in the spray nozzle in the form of an aqueous foam to provide a total water content of from 2.0 to 3.0 gallons per cubic foot of vermiculite; and

d. spraying the mixture of granules and aqueous foam upon the surface to be coated.

3,912,839

PRINTING OF REGENERATED CELLULOSE SAUSAGE CASING

G. R. Ramagopal, Appleton, Wis., assignor to Tee-Pak, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 48,814, June 8, 1970, abandoned. This application Dec. 14, 1973, Ser. No. 425,057

Int. Cl.² D06P 3/60

U.S. Cl. 428—35 7 Claims

1. A process for producing a printed regenerated cellulose sausage casing which comprises coating substantially all of the external surface area of the casing with a film-forming primer coating comprising a solution of a film-forming polymeric polyisocyanate in an active, hydroxyl free solvent, drying the primer coating thereby producing a tacky, pressure sensitive film, and then imprinting a portion of the primer coated regenerated cellulose casing with an oil base printing ink or flexographic printing ink.

3,912,840

MICROPOROUS SHEET HAVING SUEDE-LIKE SURFACE AND METHOD OF MAKING

Ralph C. Edberg, Mounds View, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 15, 1974, Ser. No. 514,808

Int. Cl.² B32B 3/26

U.S. Cl. 428—85 16 Claims

1. A microporous polymeric sheet having a suede-like surface comprising a first microporous portion and a second macroporous portion overlying and chemically integral with said first microporous portion, said second macroporous portion containing microporous and additionally having at least 50% of its volume comprising randomly oriented macrovoids distributed throughout said second portion, said randomly oriented macrovoids having an average void volume of about 7×10^{-8} to 6.5×10^{-5} cm³, a sufficient number of said voids being in open communication with the surface of the sheet to provide a suede-like surface.

4. A method of making a suede-like, polymeric sheet comprising the steps of

a. applying a polymer coating composition to the surface of a substrate, said coating composition comprising a solution of elastomeric polyurethane polymer in solvent;

b. depositing a sufficient number of removable particles on said polymer coating to form a layer completely covering said polymer coating, said particles having an average particle volume of about 7×10^{-8} to 6.5×10^{-5} cm³;

c. immobilizing the polymer coating and removing the solvent from the coating;

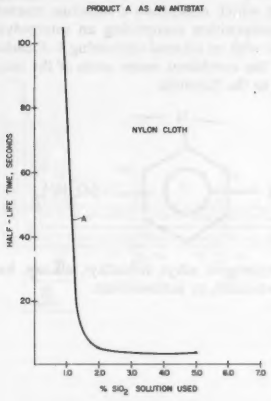
d. removing particles from the polymer coating to provide voids in said coating; and

e. drying the resulting suede-like sheet as necessary.

3,912,841
SYNTHETIC BULK FABRIC TREATED WITH ORGANICALLY MODIFIED SiO_2 AQUASOL

Charles C. Payne, Chicago; Richard E. Bloemke, River Grove, and David P. Schaefer, Hinsdale, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 31, 1973, Ser. No. 411,582
Int. Cl.² B32B 3/02, 5/16, 33/00
U.S. Cl. 428—96 5 Claims



1. Synthetic bulk fabric having improved antistatic and antisoil properties, said fabric having been treated with an aquasol containing a minor amount of an aqueous polar solvent selected from lower alkanols having uniformly dispersed therein discrete dense colloidal particles of amorphous silica having an average particle diameter of 3–150 millimicrons and average surface area of from about 20 M^2/g to 1000 M^2/g, said silica particles having absorbed on their surfaces a quaternary ammonium salt or hydroxide, with the weight ratio silica, expressed as SiO_2, to the quaternary ammonium being at least 2:1 wherein the quaternary ammonium has the formula:

$$\left[R_2 - \overset{\overset{R_1}{|}}{\underset{\underset{R_3}{|}}{N}} - R_4 \right] X^-$$

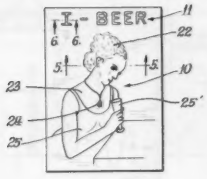
wherein
R_1, R_2 are methyl;
R_3 is methyl or a C_8—C_{20} long hydrocarbon chain;
R_4 is a C_8—C_{20} long hydrocarbon chain;
X^- is an anion selected from the group consisting of chloride, bromide, iodide, and hydroxide.

3,912,842
ARTICLE OF MANUFACTURE

William M. Swartz, 1430 W. Wrightwood Ave., Chicago, Ill. 60614

Filed Feb. 20, 1973, Ser. No. 333,537
Int. Cl.² B32B 3/28
U.S. Cl. 428—172 3 Claims

1. An article of manufacture comprising a foil having a shiny mirror-like ink receptive surface, a printed design on said surface, a second foil having a design thereon which includes portions that are mirror images of and substantially the same size as the design portions of the first foil, the two foils being laminated on opposite surfaces of a fiberboard backing with corresponding above named design portions on the two foils in register with each other, said laminate being embossed on one side and debossed on the other side at said registering design portions, said embossing and debossing

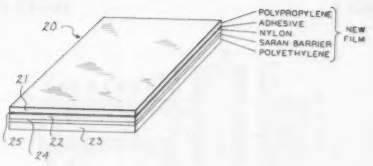


being in registration with one another and one being a counterpart of the other.

3,912,843
FLEXIBLE PACKAGING FILM

Irvin L. Brazier, Milwaukee, Wis., assignor to Milprint, Inc., Milwaukee, Wis.

Filed June 29, 1970, Ser. No. 50,614
Int. Cl.² B32B 27/34, 27/32, 27/30
U.S. Cl. 428—474 3 Claims



1. A flexible packaging film comprising multiple layers firmly joined to one another to form a composite film construction, including in combination:
1. a first exterior layer consisting of biaxially oriented polypropylene;
2. a second exterior layer consisting of a heat sealable polyolefin material; and
3. an interior layer consisting of nylon positioned between the first and second exterior layers, the film characterized in that the second exterior layer and the interior layer are each more extensible than the first layer to provide a film particularly suitable for making gas-filled packages resistant to compressive failure and burst failure.

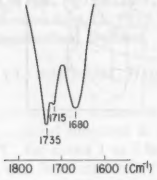
3,912,844
THERMAL RECORDING METHOD

Ichiro Endo, Kawasaki; Hiroshi Matsuno, Tokyo; Hiroshi Kokado, Tokyo; Eiichi Inoue, Tokyo; Katsuhiko Nishide, Yokohama, and Kikuo Kinjo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 1, 1973, Ser. No. 366,010
Int. Cl.² B41M 5/18
U.S. Cl. 428—500 23 Claims

1. A thermal recording member useful for forming a reversible latent image by heating which is capable of being developed into a permanent visible image, said recording member comprising a support having thereon a uniform and transparent recording layer composed of a heat-sensitive composition which comprises a polymer complex including a polymer moiety which is normally dyeable at room temperature but

which, in the polymer complex, is dyeable only after heating the complex to an elevated temperature, wherein said polymer complex is a complex of a polymer (A) and a polymer (B); and wherein said polymer (A) is a dyeable polymer selected from the group consisting of homopolymers and copolymers



of N-vinyl lactams, N-vinyl cyclic carbamates, N-vinyl imidazoles, vinyl pyridines, alkylene oxides and acrylamides; and wherein said polymer (B) is selected from the group consisting of polymers having a carboxylic acid radical, a sulfonic acid radical or an OH radical.

3,912,845

ARTICLE COMPRISING A SUBSTRATE COATED WITH AN AMINOBENZENESULFONAMIDE-ALDEHYDE INTERPOLYMER INTUMESCENT COMPOSITION

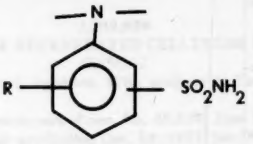
Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Division of Ser. No. 291,846, Sept. 25, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,061

Int. Cl.[2] C09D *5/18;* **C09K** *3/28*

U.S. Cl. 428—524 **10 Claims**

1. An article which comprises a substrate coated with an intumescent composition comprising an interpolymer of at least one amine with an alkanal containing 1–5 carbon atoms; at least half of the combined amine units of the interpolymer corresponding to the formula:



wherein R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido.

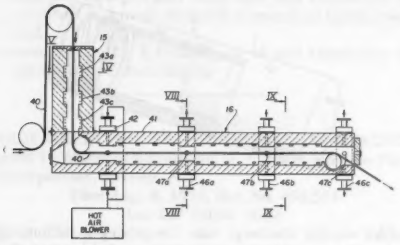
3,912,846
APPARATUS FOR MANUFACTURING STEEL PLATES COATED WITH ALUMINIUM POWDER

Hidehisa Yamagishi; Takashi Kamata; Yoshio Ujiki; Fumitoshi Yokoi, and Tadao Takahashi, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 170,063, Aug. 9, 1971, Pat. No. 3,769,068. This application July 3, 1973, Ser. No. 376,111

Int. Cl.² H05B *11/00*

U.S. Cl. 13—5 **8 Claims**



1. A heating furnace for use in the manufacture of steel plates coated with aluminum powder, comprising:

housing means for receiving a moving steel plate coated with aluminum powder;

a high frequency induction heating means in said housing means for heating said steel plate, said heated steel plate conducting heat gradually to the outer portion of said coating;

a radiation type heating means in said housing means for heating said coating, the heated coating conducting heat gradually toward the inside thereof;

a hot air blowing device at the entry side of said housing means for supplying fresh air to said furnace; and

exhaust means coupled to said housing means for removing wetted hot air from said furnace.

3,912,847
DEVICE FOR SECURING AN ELECTRODE AND SUPPLYING ELECTRIC CURRENT THERETO

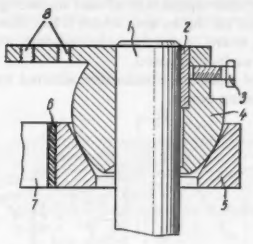
Boris Izrailevich Medovar, bulvar Lesi Ukrainki, 2, kv. 8; Georgy Alexandrovich Boiko, ulitsa Vladimire- Lybedskaya, 16, kv. 106; Ilya Iosifovich Kumysh, Vozdukhoflotsky prospekt, 42, kv. 51; Valery Alexandrovich Prikhodko, bulvar Davydova, 7. kv. 4; Jury Fedorovich Alferov, bulvar Lepse, 29, kv. 64, all of, Kiev; Valentin Alexandrovich Nosanov, ulitsa Telmana, 58/3, kv. 13, Leningrad; Volf Iudovich Rabinovich, ulitsa Gagarina, 39, kv. 43, and Igor Alexandrovich Svitenko, ulitsa Gagarina 52, kv. 11, both of Chekhov, Moskovski oblasti, all of U.S.S.R.

Continuation of Ser. No. 295,464, Oct. 6, 1972, abandoned, which is a continuation of Ser. No. 163,751, July 19, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,497

Int. Cl. H05b *7/10*

U.S. Cl. 13—16 **4 Claims**

1. A device for securing an electrode and supplying electric current thereto, intended for use mainly in apparatus for electroslag remelting, comprising: a current-conducting holder whose outer surface has a spherical shape; an electrode conductively secured in said holder; means for effecting electrical connection with said holder for supplying electric current therethrough to said electrode; and a seat adapted for



said holder to rest thereagainst on a spherical region of the current-conducting holder.

3,912,848
VACUUM ELECTRIC ARC FURNACE WITH LOCK CHAMBER

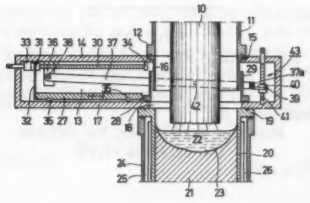
Rudolf Randa, Grossauheim, Main, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Nov. 14, 1974, Ser. No. 523,938

Claims priority, application Germany, Nov. 15, 1973, 2356996

Int. Cl.² F27D *7/06*

U.S. Cl. 13—31 **3 Claims**



1. A vacuum electric arc furnace for consumable electrodes comprising, in combination, a crucible; a bottom section enclosing said crucible; a movable top section for receiving said consumable electrodes; a lock chamber between said bottom section and said top section and having a lock valve; an annular splash protector concentric with the crucible axis and movable vertically with said lock chamber, said splash protector being seated on said lock valve when said lock valve is closed, said splash protector being flush with the top side of said valve and being pressable thereto, said splash protector turning into an apron towards the top, said lock chamber having a fixed opposite apron cooperating with the apron of the splash protector telescopically throughout at least a major portion of the travel.

3,912,849
COMPOSITE PRINTED CIRCUIT BOARD

Lucius Ponder Thomas, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 345,667, March 28, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,359

Int. Cl.² H01B *7/34, 9/06*

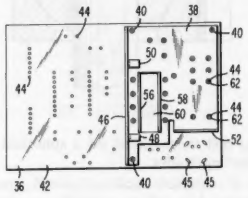
U.S. Cl. 174—16 R **6 Claims**

1. A printed circuit composite board for use in an electronic apparatus chassis, comprising:

an insulating board having top and bottom surfaces and a sheet metal board,

said boards being laminated together with said metal board resting on said top surface of said insulating board, said metal board having an area which is less than that of said insulating board, whereby said insulating board has part of its top surface exposed,

a network of electrical conductors adhered to surfaces of said insulating board,



means on said insulating board for mounting circuit components thereon,

means on said metal board for mounting circuit components thereon,

means for electrically shielding one part of an electronic circuit from another, which comprise at least one bent-up portion of said metal, and

means attached to said shield means for mounting circuit components thereon.

3,912,850

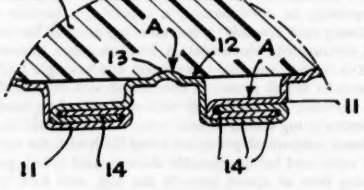
HIGH FREQUENCY COAXIAL CABLE

Saverio Thomas Bruno, Danbury, and Norbert Joseph Sladek, Fairfield, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 1, 1973, Ser. No. 402,096

Int. Cl. H01b *11/18*

U.S. Cl. 174—28 **8 Claims**



1. A high frequency coaxial cable, comprising;

an outer conductor with spaced interior convolutions presenting inner surfaces;

at least one inner conductor disposed axially within the outer conductor;

a dielectric member around the inner conductor with a plurality of axially aligned arms extending to the outer conductor; and,

at least one inwardly extending detent spaced along the inner surfaces of the outer conductor in compressive engagement with the arms of the dielectric member to lock said member in a desired position with the radial position of said detent selected in accordance with a desired electrical characteristic of said cable to control said electrical characteristic.

3,912,851

ELECTRIC DISCHARGE TUBE AND METHOD OF MANUFACTURING SAME

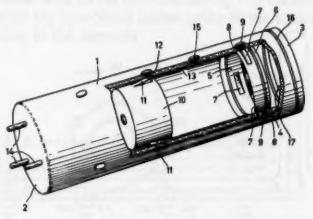
Gerardus Arnoldus Herman Maria Vrijssen; Jacobus Stoffels, and Johannes Hendrikus Coppens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,184

Claims priority, application Netherlands, May 23, 1973, 7307168

Int. Cl.² H01J *9/36, 19/50*

U.S. Cl. 174—50.54 **9 Claims**



1. An electric discharge tube comprising a vacuum-tight envelope having at least one aperture sealed by an indium-containing material to form an electrically conductive lead-through, an electrode member arranged within said envelope, at least a portion of said member being spaced apart from the inner wall of said envelope and having a projection bonded to said indium-containing material.

3,912,852

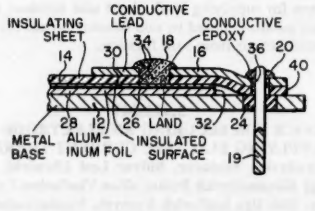
THIN-FILM ELECTRICAL CIRCUIT LEAD CONNECTION ARRANGEMENT

Alan J. Simon, Level Green, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,237

Int. Cl.² H05K *1/04*

U.S. Cl. 174—68.5 **6 Claims**



1. A thin-film electrical circuit assembly comprising:

a flat base member;

a plurality of terminals supported at an outer portion of said base member;

a conductive foil substrate supported on said base member inwardly of said terminals, said conductive foil substrate having an insulated surface and uninsulated peripheral edges exposed by separation of the substrate from adjacent areas of conductive foil material having the insulated surface;

a plurality of thin-films deposited on said insulated surface of said substrate so as to form a thin-film electrical circuit, and a plurality of conductive lands extending from the electrical circuit and toward the peripheral edges of the substrate for defining connecting points for making electrical connections to the electrical circuit;

a thin insulating sheet substantially covering said base member and said conductive foil substrate, said insulating sheet having a plurality of conductive lead members on

the side thereof away from said base member, said plurality of conductive lead members having predetermined positions overlapping said lands and extending away therefrom to said terminals, said insulating sheet having openings therethrough at one end of said conductive lead members, said openings in the insulating sheet being aligned over said lands with a portion of the insulating sheet and a portion of the conductive lead members thereon extending over the complete extent of the adjacent peripheral edges of the substrate with the outer portion of the insulating sheet engaging said base member;

a conductive bonding material extending through said openings and between said lands and said conductive lead members to provide electrical connections therebetween; and

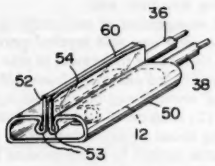
means connecting a second end of said conductive lead members to said terminals.

3,912,853

HIGH DIELECTRIC STRENGTH CABLE CONNECTOR

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Plessey Incorporated, Melville, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,551
Int. Cl.² H02G *15/08*
U.S. Cl. 174—84 C **3 Claims**



1. An insulated joint electrically connecting at least a pair of unstripped, insulated wires comprising:

a channel-type metal jointing clip having channel walls bent over a web portion in a mechanically-interlocking relation with said wires located therebetween;

said clip including inwardly-extending protrusions piercing said insulation and in electrically-conductive engagement with said wires; and

a channel of resiliently flexible insulating material wrapped around said clip, said insulating channel extending longitudinally beyond the ends of said clip, the upper side walls of said insulating channel being locked between the edges of the inwardly-bent walls of said clip forming buckled loops within said joint with the free ends of said insulating channel sidewalls extending upwardly between the edges of said inwardly bent clip walls.

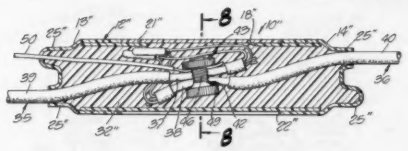
3,912,854

ENCAPSULATED CONDUCTOR JUNCTION

John T. Thompson, 244 Loring St., Los Angeles, Calif. 90053, and George W. Gillemot, 2331 - 20th St., Santa Monica, Calif. 90406

Division of Ser. No. 884,874, Jan. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 797,943, Feb. 10, 1969, abandoned. This application July 12, 1971, Ser. No. 161,562
Int. Cl.² H02G *15/08*
U.S. Cl. 174—88 C **9 Claims**

1. A conductor junction utilizing a non-wrenchable split bolt electrical connector electrically interconnecting the metallic shielding shrouds of a plurality of conductors comprising: a pair of mated threaded parts each lacking wrench engaging surfaces and including a threaded ring and a shank, said shank being threaded and having a deep slot axially thereof and opening through its threaded end, said slot receiving and firmly seating the shielded shrouds of a plurality of conductors between the inner end of said slot and the adjacent inner face of said threaded ring, the periphery of said threaded ring being roughened to facilitate gripping the same between the user's thumb and forefinger to tighten the same to the extent possible by an operator's finger and without risk of damage to said shielding shrouds, said threaded ring being tightened on said threaded shank gripping the shielding



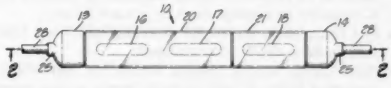
shrouds between the inner end of said slot and the adjacent face of said threaded ring, and said tightened threaded parts and the adjacent portions of said sheathed conductors being embedded in solidified potting compound effective to isolate said threaded parts from contact with conductive objects and effective to lock said threaded parts against loosening despite vibration and temperature changes.

3,912,855

ENCAPSULATING SPLICE ASSEMBLY

John T. Thompson, 244 Loring St., Los Angeles, Calif. 90053, and George W. Gillemot, 2331 20th St., Santa Monica, Calif. 90406

Continuation of Ser. No. 352,915, April 20, 1973, abandoned, which is a continuation of Ser. No. 161,563, July 12, 1971, abandoned, which is a division of Ser. No. 884,874, Jan. 26, 1970, abandoned, which is a division of Ser. No. 884,874, Jan. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 797,943, Feb. 10, 1969, abandoned. This application Dec. 30, 1974, Ser. No. 537,092
Int. Cl.² H02G *15/08*
U.S. Cl. 174—93 **11 Claims**



4. An encapsulating assembly for conductor junctions and the like comprising a length of rigid plastic tubing having capped ends at least one of which is capped by an end cap telescoped over the exterior end portion of said tubing and said end cap having provision to receive with a close fit a plurality of conductors adapted to have their ends secured together in electrically conducting relation interiorly of said tubing, said encapsulating assembly having a charging opening which is equipped with a manually manipulatable valve, which is restricted to a portion of said tubing spaced inwardly from either end thereof, and through which potting compound can be charged and air can escape as it is replaced by potting compound charged into said tubing, said valve being permanently mounted on said tubing and being movable relative to said tubing between an open position wherein it opens said charging opening and a closed position wherein it closes same, and said charging opening being adapted to be sealed closed by potting compound as the charging operation is concluded thereby to provide a weatherproof hermetically sealed encapsulating assembly.

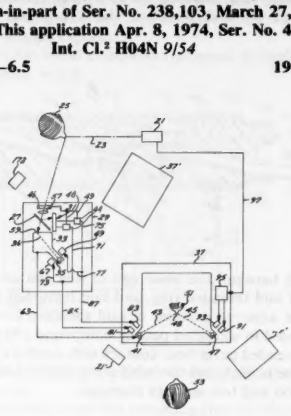
3,912,856
THREE-DIMENSIONAL IMAGE TRANSMITTING APPARATUS

William S. Liddel, deceased, late of Fullerton, Calif., and by Orval Liddell, executor, P.O. Box 1533, Avalon, Calif. 90704

Continuation-in-part of Ser. No. 238,103, March 27, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,051

Int. Cl.² H04N 9/54

U.S. Cl. 178—6.5 19 Claims



1. Three-dimensional image transmitting apparatus comprising:

camera means including first scan beam means for projecting a scan beam in a predetermined direction toward a subject and operable to oscillate said beam to progressively scan the surface of said subject for reflection therefrom in a second direction to trace patterns corresponding with the contours of said object scanned during each pass of said scan beam across the surface of said subject; signal generator means including signal generator screen means disposed in the path of said scan beam as reflected from said subject and responsive to localized impingement by said scan beam to generate a first electrical location signal corresponding with the location of the point of impingement thereon by said scan beam;

image construction means including variable depth screen means operative in response to impingement by a trace beam to be rendered locally luminous at variable depths in response to impingement by a trace beam;

a first trace beam means for directing said trace beam at said variable depth screen means;

variable depth screen control means for controlling the operative depth of said variable depth screen means in coordination with the pattern traced by said beam means; and

trace beam control means coupled with said signal generator means and said trace beam means and responsive to said electrical location signal to move said trace beam in patterns dictated by said signal generator means to trace an image in said variable depth screen means corresponding with the contour of said subject.

3,912,857
STYLUS ARM PIVOT

Michael Evans Miller, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,695

Claims priority, application United Kingdom, Mar. 26, 1973, 14394/73

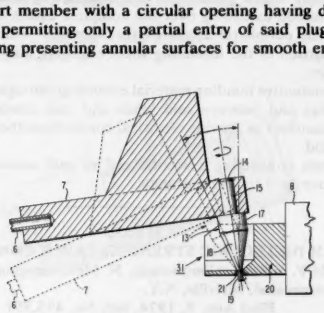
Int. Cl. G11b 3/38

U.S. Cl. 178—6.6 A 10 Claims

9. In a playback system including a board, a turntable mounted for rotation relative to said board, said turntable having a surface adapted to receive a disc having a spiral groove with information recorded therein, a stylus subject to positioning in said spiral groove for detecting said recorded information, a stylus arm carrying said stylus, and a stylus arm carrying structure linked to said board, a stylus arm pivot coupling, comprising:

a plug having a longitudinal axis, said plug having one end thereof secured to said stylus arm, said plug having a tapered portion with circular cross section in a region remote from said one end;

a support member with a circular opening having dimensions permitting only a partial entry of said plug, said opening presenting annular surfaces for smooth engagement with a surface of said tapered portion of said plug; wherein said support member is attached to said stylus arm carrying structure; and



wherein said engagement of said surfaces of said support member opening and said tapered portion of said plug permits (1) a rocking movement of said longitudinal axis of said plug toward and away from said turntable to accommodate vertical motion of said stylus during playback, and (2) rotation of said plug in said support member opening about an axis substantially perpendicular to said turntable surface to accommodate lateral motion of said stylus during playback.

3,912,858
DEVICE FOR THE DETECTION OF SIGNAL DROP-OUTS

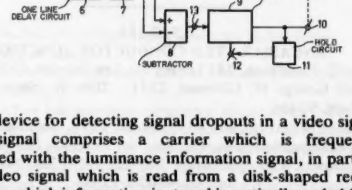
George Churchill Kenney, Briarcliff Manor, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,842

Claims priority, application Netherlands, Feb. 14, 1974, 7402014

Int. Cl.² H04N 5/76

U.S. Cl. 178—6.6 R 10 Claims



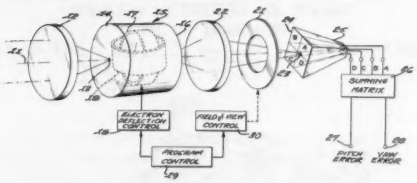
1. A device for detecting signal dropouts in a video signal, which signal comprises a carrier which is frequency-modulated with the luminance information signal, in particular a video signal which is read from a disk-shaped record carrier on which information is stored in optically coded form in a trackwise pattern of blocks and areas of variable length, characterized in that the device includes a first delay line with a delay of one line time connected to receive said read video signal, a first demodulator circuit receiving said video signal for demodulating the luminance information signal contained in the modulated carrier, a second demodulator connected to an output of said first delay line for demodulating the luminance information signal, a substractor circuit for subtracting said demodulated luminance signal and the demodulated

luminance information signal which is delayed by one line time with the aid of the first delay line from each other, a signalling circuit to which the output signal of the subtractor circuit is applied and which supplies a signalling pulse at its output if the signal applied to its input within a certain constant time interval passes through a full period of an at least approximately sinusoidal signal, an inhibiting circuit which establishes the connection between the output of the signalling circuit and the output terminal of the device, and a hold circuit whose input is connected to said output terminal and which after the appearance of a signalling pulse at said output terminal supplies a hold pulse with a delay of one line time and a duration substantially equal to that of the signalling pulse, which hold pulse is fed to a control input of the inhibiting circuit, so that during said hold pulse no furthe signalling pulse can reach the output terminal.

3,912,859
ELECTRONIC TRACKING DEVICE

Rodger L. Christopherson, Garden Grove, Calif., assignor to Philco-Ford Corporation (Now Aeronutronic Ford Corporation), Blue Bell, Pa.

Filed June 8, 1962, Ser. No. 201,041
Int. Cl.² H04N 7/00
U.S. Cl. 178—6.8 **7 Claims**



1. In an electronic tracking device sensitive to radiation of scanned targets the combination of:

focusing means having an optical axis for forming an optical image of a target,

means for converting said optical image to an electronic image at a focal point,

means for nutating said electronic image in a focal plane about said optical axis,

detector means comprising a plurality of separated detector surfaces,

means responsive to said nutated electronic image for forming a target image on said detector surfaces,

and means for measuring the proportional duration of said target image on each of said surfaces to provide signal proportional to the deviation of said target from said optical axis.

3,912,860
IMAGE DISPLAY SYSTEM

Kaoru Sasabe, Ikeda, and Heijiro Hayami, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

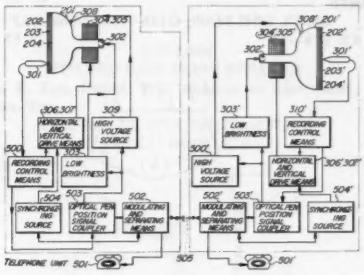
Continuation-in-part of Ser. No. 255,251, May 22, 1972, abandoned. This application June 10, 1974, Ser. No. 477,912
Int. Cl.³ H04N 7/18
U.S. Cl. 178—6.8 **7 Claims**

1. An image display system, comprising:

an electron tube having a face plate provided on the inner side thereof with a screen layer, said screen layer being composed of a plurality of fluorescent material areas enclosed by a cathode chromic material area in a plane, said cathode chromic material producing color centers when bombarded by an electron beam;

means for sweep scanning an electron beam over said screen layer;

an optical pen disposed in front of said electron tube for detecting light generated as said fluorescent material areas of said screen is scanned by the electron beam; and means for controlling the electron beam produced by said

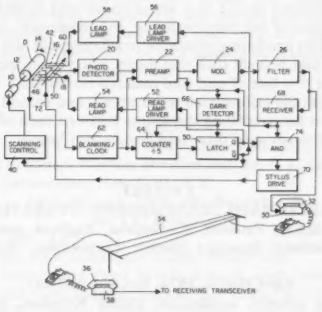


sweep scanning means in accordance with the output signal of said optical pen to switch the bombardment of the electron beam from said plurality of fluorescent material areas to said cathode chromic material area, to thereby display the trace of said optical pen on said face plate.

3,912,861
METHOD AND APPARATUS FOR TIME COMPRESSION OF FACSIMILE TRANSMISSIONS

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 30, 1974, Ser. No. 437,914
Int. Cl.² H04N 7/12
U.S. Cl. 178—7.1 **18 Claims**



18. The method of operating a facsimile transmitter comprising optical sensor means in optical communication with a document at a leading position and a reading position during scanning of said document with said leading position scanning in advance of said reading position, said method comprising the following steps:

illuminating said reading position without illuminating said leading position while slowly scanning areas of said document having a relatively high density of dark regions; and illuminating said leading position while rapidly scanning areas of said document having a relatively low density of dark regions.

3,912,862
METHOD AND APPARATUS FOR PREPARING INFORMATION CARRIERS

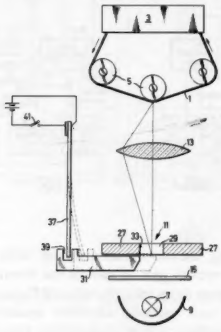
Antonius Vinnemann, Stuttgart; Joachim Marz, Leinfelden, and Dieter Lohse, Bonlanden, all of Germany, assignors to Franz Morat GmbH, Stuttgart, Germany

Filed Aug. 15, 1973, Ser. No. 388,448

Claims priority, application Germany, Aug. 18, 1972, 2240688

Int. Cl. H04l *21/00;* **G11b** *7/00;* **G06k** *1/12*

U.S. Cl. 178—15 **17 Claims**



9. Apparatus for preparing an information carrier storing information represented by light transmitting areas and opaque areas, said areas being applied in a plurality of first spaced parallel lines and in a plurality of second spaced parallel lines crossing said first lines, said first spaced lines being spaced by first opaque barrier lines, comprising: an irradiation device including a mask with a first slit extending parallel to said first spaced lines, the length and the width of said slit corresponding at least to the length and the width of a complete first line of information areas; means for transporting a carrier composed of sensitive negative film material relative to said irradiation device in a direction parallel to said second spaced lines of information areas; and irradiation device including first irradiating means for irradiating said film material through said first slit such that during every irradiation step a complete first line of said film material is irradiated in accordance with the information to be stored, and second irradiating means for irradiating the spaces between each of the first spaced lines so as to form said first barrier lines.

3,912,863
TELEGRAPH TRANSMISSION APPARATUS

Brian Michael Patience, Eastbourne, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,043

Claims priority, application United Kingdom, June 14, 1973, 28289/73

Int. Cl. G11c *17/00;* **H04l** *13/08*

U.S. Cl. 178—17.5 **6 Claims**

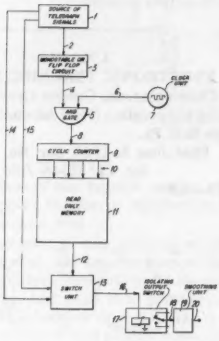
1. A waveform generating arrrangement in a telegraphic communication system for generating, in response to the application of square-wave transitions between mark and space input signals, transitions, between first and second output signal levels, with a predetermined profile of transitions which arrangement comprises:

a digital storage means containing one or more digital words and arranged to be read out serially-by-bit, said one or more digital words providing a pulse-width modulated pulse train representing said predetermined profile of transitions;

access means coupled to said storage means for accessing the word or words in said storage means;

enabling means coupled to said access means, said enabling means being activated by transitions between mark and space conditions of telegraphic input signals to enable said access means so that the contents of said storage means may be read out serially and without interruption; and

switching means coupled to said storage means, said switching means being under control of said input signals to



apply the serially-read contents of said storage means either directly or after inversion, depending on the direction of transition of said input signals, to an output circuit, in which the contents of said storage means form said pulse-width modulated pulse train representing said predetermined profile of transitions, and in which the output circuit includes a smoothing circuit which effectively demodulates said pulse-width modulated pulse train so that the output of said output circuit contains transitions with said predetermined profile.

3,912,864
CIRCUIT ARRANGEMENT FOR SUPPLYING PULSES HAVING A DEFINED PULSE EDGE DURATION IN A TELEVISION IMAGE SIGNAL

Nicolaas Jan Leendert Van Der Valk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,605

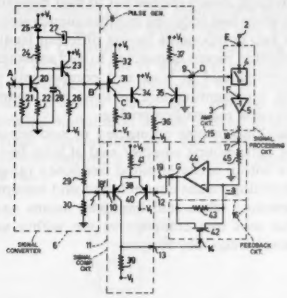
Claims priority, application Netherlands, Aug. 18, 1972, 7211380

Int. Cl.² H04L *7/00;* **H04N** *3/16*

U.S. Cl. 178—69.5 TV **9 Claims**

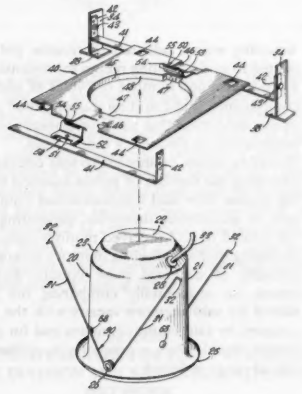
1. A circuit arrangement for supplying pulses having a defined pulse edge duration in a television image signal, the circuit arrangement comprising a signal converter provided with an input for the supply of a line blanking signal or a line synchronizing signal associated with a television standard, and an output conveying a signal having pulses of defined pulse edge duration, an amplifier circuit having an input for the supply of the image signal and an output which is connected to an input of a signal comparator circuit having a further input coupled to said converter output for the supply of said signal having pulses of the defined pulse edge duration, the output of said signal comparator circuit being connected to a

control input of the amplifier circuit for reducing its amplification if the amplitude of the output signal thereof exceeds the



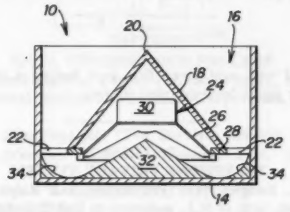
amplitude of said signal having pulses of defined pulse edge duration while the image signal is being supplied.

3,912,865
LOUDSPEAKER ARRANGEMENT
Frederick L. Seebinger, Smoke Rise, N.J., assignor to American Trading and Production Corporation, Baltimore, Md.
Filed July 13, 1973, Ser. No. 378,853
Int. Cl.² H04R 1/28
U.S. Cl. 179—1 E **10 Claims**



1. A mounting for a loudspeaker in a drop ceiling or "false wall" structure of a type having panels or tiles, said mounting being supportable on beams suspended from a support structure or said panels or tiles, said mounting comprising, in combination, housing means including a substantially cylindrical housing having a side wall, a closed upper end, an open lower end, and a peripheral flange at said open lower end, said housing means being insertable through a conforming opening in a panel or tile, said peripheral flange being engageable with the exterior surface of the panel or tile around said conforming opening; a loudspeaker connector means secured to said housing means adjacent its closed upper end, mounting means securing said housing means to said structure with said flange sitting against the exterior surface of a panel or tile; a loudspeaker positioned within and protected by said housing means, and having electrical leads extending to said connector means, said loudspeaker having a peripheral rim, an annular cross section ring having an outer diameter substantially equal to the inner diameter of the side wall of said housing, means securing the rim of said loudspeaker to a horizontal leg of said annular cross section ring, the vertical leg of said annular cross section ring having apertures alignable with apertures in the side wall of said housing, and resilent clip-type rivets insertable, from the exterior of said housing, through the aligned openings in the side wall of said housing and in the vertical leg of said ring to mount said ring and said loudspeaker within said housing.

3,912,866
FOLDED BASS HORN SPEAKER
Ronald E. Fox, Dallas, Tex., assignor to Showsound, Inc., Dallas, Tex.
Filed Jan. 30, 1974, Ser. No. 437,888
Int. Cl.² H04R 1/28
U.S. Cl. 179—1 E **17 Claims**

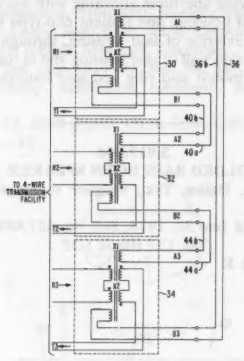


1. A folded horn speaker comprising:
a rectangular cabinet having a rear wall and a front speaker opening,
a housing having a closed end directed toward said front speaker opening and an open end directed toward said rear wall,
a speaker mounted within said housing for directing acoustic energy through said open end toward said rear wall,
a four sided reflector having the shape of a pyramid with the rectangular pyramid base attached to said rear wall and the pyramid vertex disposed toward said speaker, said reflector being spaced from said speaker such that acoustic energy is reflected from said reflector and travels around the periphery of said housing outwardly through said front speaker opening.

3,912,867
FOUR-WIRE CONFERENCE CIRCUIT
Leopold Frederick Goeller, Jr., Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.
Filed May 13, 1974, Ser. No. 469,328
Int. Cl.² H04M 3/56
U.S. Cl. 179—1 CN **5 Claims**

1. A four-wire conference circuit comprising:
first, second and third hybrid circuits each having first, second, third and fourth ports, each of said hybrid circuits providing signal coupling from one port to two other ports associated therewith, the first port of each hybrid circuit being connected to the receive side of a four-wire transmission facility, the second port of each hybrid circuit being connected to the transmit side of said fourwire transmission facility;
first means for connecting the fourth port of the first hybrid circuit to the third port of the second hybrid circuit;
second means for connecting the fourth port of the second hybrid circuit to the third port of the third hybrid circuit; and
third means for connecting the fourth port of the third hybrid circuit to the third port of the first hybrid circuit; the connections of said ports providing substantial signal

coupling between any given one of said first ports and all of the non-associated second ports, the second port associated with said given first port having a substantially lower signal level coupled thereto.

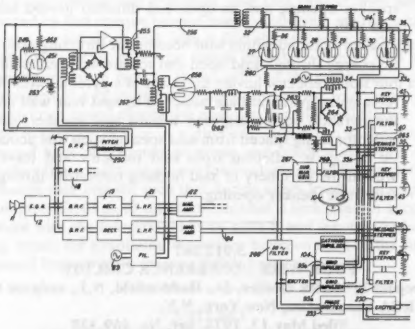


3,912,868

TELEPHONE PRIVACY SYSTEM

Robert H. Badgley, New Providence, and Ralph L. Miller, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 17, 1943, Ser. No. 495,124
Int. Cl. H04l *9/00*
U.S. Cl. 179—1.5 R **14 Claims**



1. In a system for transmitting indications of an electrical quantity of varying magnitude, means to transmit indications in the form of stepped values each corresponding approximately to the magnitude of the quantity at the corresponding time, means to compare the respective stepped values against the true values of the quantity to determine the residues of the true values over and above said stepped values in each case, and means to separately transmit indications of said residues.

3,912,869

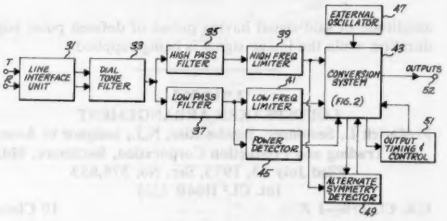
MULTIFREQUENCY-TO-DIGITAL CONVERTER

Richard J. Ullakko, Kirkland, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed Nov. 21, 1973, Ser. No. 418,098
Int. Cl. H04m *1/50;* **H04q** *9/12*
U.S. Cl. 179—84 VF **25 Claims**

1. A multifrequency-to-digital converter comprising:

1. receiving means for receiving a multifrequency signal including at least two components having different frequencies;
2. separating means connected to said receiving means for separating said received multifrequency signal into said at least two components having different frequencies; and
3. conversion means connected to said separating means for converting said at least two components into a digital signal representing said at least two components, said conversion means comprising:
   a. bandpass means connected to said separating means for determining whether said at least two components are within predetermined frequency ranges;
   b. detecting means connected to said bandpass means for detecting when said bandpass means has determined that said two components are within said predetermined frequency ranges;



c. counting means adapted to receive pulses and connected to said detecting means for counting pulses over a predetermined number of cycles of said at least two components, said counting starting when said bandpass means determins that said components are within said predetermined frequency ranges; and,

d. decoding means connected to said counting means for decoding the number of pulses counted by said counting means over said predetermined number of cycles and, in accordance therewith, generating a digital signal related to said received multifrequency signal, said decoding means including memory means for storing a plurality of different pulse counts; and, comparing means for sequentially comparing the pulse counts stored by said memory means with the pulse counts counted by said counting means and for generating an output signal when a comparison, within a predetermined range is found.

3,912,870

DIGITAL GROUP MODULATOR

Marie-Annick Roy, Antony, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 7, 1973, Ser. No. 422,681
Claims priority, application France, Dec. 7, 1972, 72.43662
Int. Cl.³ H04J *1/08, 1/18*
U.S. Cl. 179—15 FS **3 Claims**

1. A group modulator having digital operation for processing samples drawn from n voice frequency channels comprising sampling means for sampling said n voice frequency channels at a frequency F_e, analog-digital converter means for converting the samples to digital values, first and second double modulation circuits connected to each receive the outputs of said analog-digital converter means and providing respective outputs including a plurality of sampled carrier frequencies equal in number to n/2, said first and second

double modulation circuits each including a first modulation stage connected to receive the digital samples and a sampled modulation signal, the sampled modulation signals representing sine and cosine values of a first modulation frequency in the respective first modulation stages, said first and second double modulation circuits each further including a digital filter connected to the output of said first modulation stage and a second modulation stage connected to the output of the digital filter and to means providing a sampled modulation signal, the sampled modulation signals applied to said second modulation stage representing sine and cosine values of a second modulation frequency in the respective second modulation stages, a digital adder connected to the respective outputs of said first and second double modulation circuits including reversing switch means for alternately reversing the operation of said digital adder between addition and subtraction of said respective modulator outputs, a digital-analog converter connected to the output of said digital adder, first and second analog filters having their outputs connected in common, and additional switch means connected to operate at the same frequency as and in phase synchronization with said reversing switch means for alternately connecting the output of said digital-analog converter to the respective inputs of said first and second analog filters.

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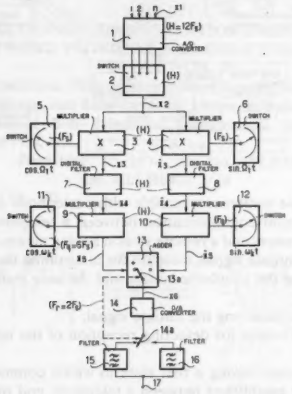


3,912,871
METHOD AND APPARATUS FOR IDLE PATH SEARCH IN A TIME DIVISION MULTIPLEXED SWITCHING NETWORK

Frank E. Battoclетti, Columbus, Ohio, assignor to North Electric Company, Galion, Ohio

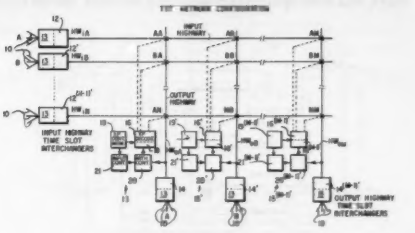
Filed Dec. 27, 1973, Ser. No. 428,791
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AQ **16 Claims**

8. Pathfinding apparatus for selecting time slots in cyclically recurring frames for a signal path between two selected lines of a digital switching network, having status memory means for listing the busy or idle status of each time slot on one of said selected lines and having means for encoding available idle time slots on only the other of said selected lines with a signal indicating the availability of the time slots, a control comprising:

means responsive to the listing in said status memory means for identifying the busy or idle status of each time slot on said one line;

means including switching means enabled to provide a signal path between said selected lines during each time slot identified as idle on said one line for carrying signals between the lines; and

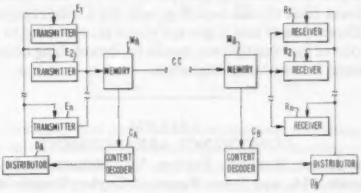
means detecting an encoded signal carried to said one line from said other for indicating a time slot available on both of said selected lines, and means to register the identity of the last said time slot for use by processing apparatus.



3,912,872
DATA TRANSMISSION PROCESS

Paul Raymond Callens, Cagnes-sur-Mer, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,605
Claims priority, application France, Sept. 28, 1973, 73.35909
Int. Cl.² H04J *3/12*
U.S. Cl. 179—15 BA **8 Claims**



1. The method of multiplexing data from a plurality of sources comprising the steps of:

a. storing a plurality of previously multiplexed data bits;

b. decoding said stored data bits as an address of one of said sources of data bits to be multiplexed;

c. multiplexing at least one data bit from said one of said sources;

d. storing said at least one data bit multiplexed in place of an equal number of previously stored data bits and repeating steps (*b*), (*c*) and (*d*).

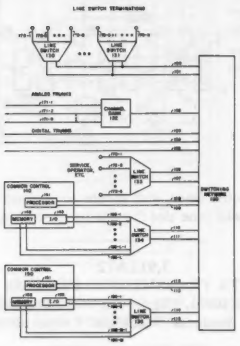
3,912,873
MULTIPLE FAULT TOLERANT DIGITAL SWITCHING SYSTEM FOR AN AUTOMATIC TELEPHONE SYSTEM

Nikola J. Skaperda, Delaware, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Jan. 17, 1974, Ser. No. 434,268
Int. Cl.² H04M *3/00*
U.S. Cl. 179—18 FC **29 Claims**

1. In a ditial switching arrangement for an automatic telephone system, a plurality of lines, a plurality of line switch means, each of which line switch means includes input means connected to a different one of said lines, and each of which line switch means is operative to concentrate signals input from its lines for use in the system, at least one switching network comprised of at least a first and second subnetwork, at least a first time division link connecting the signal output of each of a plurality of said line switch means to said first subnetwork, and a second time division link connecting the signal output of the same plurality of line switch means to said

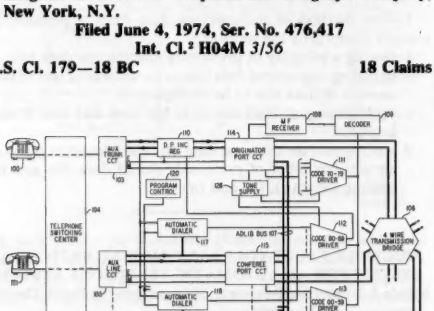
second network, a plurality of highways, a plurality of multiplexer means in each of said subnetworks for selectively connecting said first and second time division links to said highways, and time-space-time switching network means comprising a plurality of switch groups for each of said subnetworks, different ones of said switch groups for a subnetwork having a different one of said highways which is connected to a different one of said multiplexer means for establishing connections between its associated highways.



3,912,874
CONFERENCE ARRANGEMENT

John Joseph Botterell, Fairfax, Va.; Robert Lewis Dayton, Bowie, Md., and James Raymond Guyler, Woodbridge, Va., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed June 4, 1974, Ser. No. 476,417
Int. Cl.² H04M *3/56*
U.S. Cl. 179—18 BC **18 Claims**

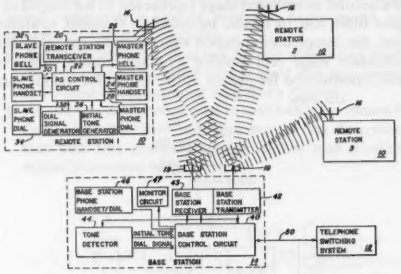


1. A conference arrangement for use with a switching system comprising a multiport transmission bridge, an originating circuit for coupling a calling customer station to a port of said bridge, a plurality of terminating circuits each for coupling a called customer station to a corresponding port of said bridge, and control means responsive to signals received from said calling station for selecting each individual one of said terminating circuits and thereafter selectively controlling the mode of voice path coupling of said selected terminating circuits in response to additional signals.

3,912,875
RADIO-TELEPHONE COMMUNICATION SYSTEM

Paul Katz, 8902 Bridgehaven Court, Alexandria, Va. 22308

Filed Apr. 3, 1972, Ser. No. 402,638
Int. Cl.² H04M *5/08*
U.S. Cl. 179—41 A **6 Claims**



1. In a base station connectable with a telephone system for providing radio communication between a telephone of the telephone system and a remote station having means for transmitting an initiate signal, a circuit for controlling the connection between the telephone system and the base station, comprising:

means for receiving the initiate signal;

detection means for detecting reception of the initiate signal;

switch means having a first state in which communication may be established between a telephone and the remote station and a second state in which communication between a telephone and the remote station is broken;

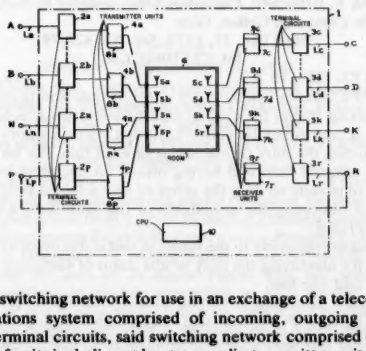
means responsive to each detection of said initiate signal for switching said switch means to its second state, when in its first state, and switching said switch means to its first state, when in its second state; and

means responsive to a ring signal generated by said telephone switching system for switching said switch means from its second state to its first state.

3,912,876
FREQUENCY DIVISION SWITCHING NETWORK

Jean Jacques Muller, Garches, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 455,984
Claims priority, application France, Apr. 5, 1973, 73.12264
Int. Cl.² H04M *7/16*
U.S. Cl. 179—41 A **11 Claims**



1. A switching network for use in an exchange of a telecommunications system comprised of incoming, outgoing and local terminal circuits, said switching network comprised of a group of units including at least one radio transmitter unit and

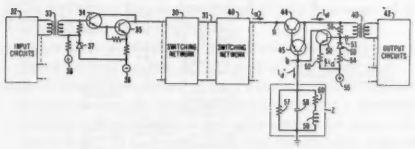
a second group including at least one radio receiver unit, said terminal circuits having connection to respective ones of said radio units for completion of intermediate paths thereto, and means for tuning one of the radio units of one group to the same frequency as a radio unit of said other group to thereby complete a radio linkage between the tuned units, responsive to the completion of an intermediate path from a terminal circuit to a radio unit of one group to complete a path over said linkage to another terminal circuit, and wherein said units each have an antenna which is contained in an enclosed space electromagnetically isolating said antennae from outside interference.

3,912,877

ELECTRICAL COMMUNICATION SWITCHING NETWORK PROVIDING FAR-END CROSSTALK REDUCTION

Arthur Rechtman Braun, Naperville; Clarence Newton Johnson, Chicago, and Rein Raymond Laane, Wheaton, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1974, Ser. No. 452,935
Int. Cl.² H04M *1/74*
U.S. Cl. 179—80 **10 Claims**



3. A communication switching system comprising a plurality of selectable conducting paths through at least one switching network stage, each of said paths presenting a predetermined sum impedance, modulating means comprising a common-emitter transistor stage presenting a collector impedance to one end of a selected one of said conducting paths, an input signal on said selected conducting path applying a first voltage on said collector, demodulating means comprising a common-base transistor stage presenting an emitter impedance to the other end of said selected path, and means for applying a second voltage out of phase with said first voltage to said other end of said selected path responsive to said input signal comprising an effective negative impedance circuit including a current source, a phase inverter circuit, and an impedance network.

3,912,878

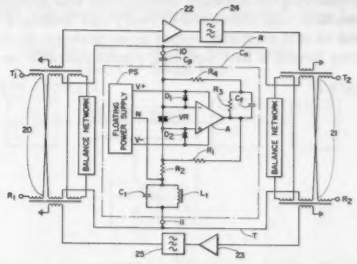
CAPACITIVE COUPLING NETWORK

Israel Levi, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 9, 1974, Ser. No. 504,458
Int. Cl.² H04B *3/16*
U.S. Cl. 179—170 R **4 Claims**

1. A capacitive coupling network, for shunting lower magnitude voice signals and higher magnitude dial pulse signals across the bypass leads in a hybrid repeater, comprising:

a positive capacitor and a negative capacitance network connected in series across the bypass leads, the negative capacitance network having a larger absolute magnitude than the positive capacitor, and including an amplifier and a resistive-capacitive network which coact to provide said negative capacitance network, the amplifier being adapted to saturate upon application of said higher magnitude dial pulse signals to said capacitive coupling network whereupon the negative capacitance network presents a positive capacitance; and thereby said capacitive coupling network presents a shunting capacitance which is higher than said positive capacitor to said lower magnitude voice signals and a shunting capacitance which is



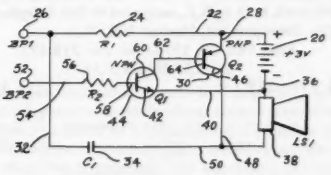
lower than said positive capacitor to said higher magnitude dial pulse signals.

3,912,879

CONTINUITY AND TONE TEST SET

William J. Lawson, P.O. Box 711, Poteet, Tex. 78065

Filed May 30, 1974, Ser. No. 474,563
Int. Cl.² G01R *31/02*
U.S. Cl. 179—175 **1 Claim**



1. A continuity and tone test set comprising: a housing, an opening in one side of said housing; a pair of binding posts mounted on a second side of said housing; an electrical circuit mounted within the housing and connected to the binding posts, said circuit including, a battery, a first resistor connected between the battery and the first binding post, a loud speaker connected to said first binding post through a capacitor, a first transistor having its emitter connected to the positive battery output and its collector connected to one side of said loud speaker, a second transistor, a second resistor connected between the second binding post and the base of the second transistor, means connecting the collector of said second transistor and the base of said first transistor, means connecting the negative terminal of the battery to the loud speaker, and means connecting the emitter of said second transistor to the battery-loud speaker connecting means whereby a connection between the first and second binding posts will produce an audio output at the loud speaker.

3,912,880

ACOUSTIC MEASUREMENT

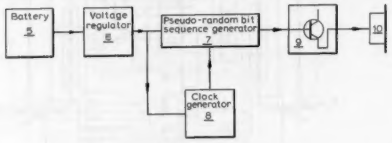
Edwin John Powter, 16 Monmouth Road, Harlington, Dunstable, Bedfordshire; Robert Humphrey Benton, Brindles, Ufford Place, Lower Ufford, Woodbridge, Suffolk, and Eric Abraham Huth, deceased, late of 620 Green Lane, Harringay, London, by Ernestine Ester Huth, legal representative, London, all of England

Claims priority, application United Kingdom, July 6, 1973, 32370/73

Filed July 5, 1974, Ser. No. 486,240
Int. Cl. H04r *29/00*
U.S. Cl. 179—175.1 A **21 Claims**

1. A system for measuring a frequency response of an acoustic-electric transducer and associated circuitry including an acoustic generator adapted to be sealed to an acoustic-electric transducer housing, said acoustic generator arranged

to generate an acoustic signal having a plurality of discrete sinusoidal frequencies; receiver means electrically connected to said acoustic-electric transducer and associated circuitry for receiving an electrical output from said acoustic-electric transducer and associated circuitry and feeding a signal related to said electrical output to an analogue to digital converter having a first sampling means operable to sample a



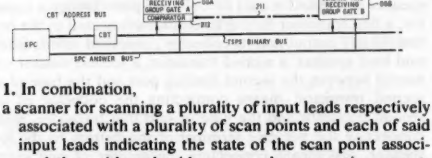
received signal at a variable sampling rate; control means connected to said sampling means for controlling said variable sampling rate in response to variations in frequency of said received signal; a Fourier analyser means, connected to an output of said analogue to digital converter and arranged to derive the frequency response of said acoustic electric transducer.

3,912,881

SCANNER DIAGNOSTIC ARRANGEMENT

Livio Angelo Rigazio, Freehold, and Dennis Joseph Sassa, Englishtown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1974, Ser. No. 518,477
Int. Cl.² H04M *3/24*
U.S. Cl. 179—175.2 R **10 Claims**



1. In combination,

a scanner for scanning a plurality of input leads respectively associated with a plurality of scan points and each of said input leads indicating the state of the scan point associated therewith and said scanner also generating reports concerning changes in state of said scan points,

transmission means including a buffer for transmitting said reports over a communication channel, said buffer temporarily storing said reports prior to transmission thereof, simulation means for causing the input lead associated with a particular scan point to assume one state, and responsive to said scanner scanning said input lead associated with said particular scan point for causing the input leads associated with the other scan points to assume a different state, and

said transmission means further including bypass means for bypassing a report concerning said particular scan point around said buffer and applying said bypassed report to said transmission means for immediate transmission thereof.

10. For use with a scanner sequentially scanning a plurality of scan points and generating reports concerning the state of said scan points, said reports normally being stored in a buffer and then being applied to transmission means for transmission over a communication channel,

means for inhibiting the application of said reports from said buffer to said transmission means,

actuatable bypass means for bypassing reports from said scanner around said buffer and applying said bypassed reports directly to said transmission means for immediate transmission thereof, and

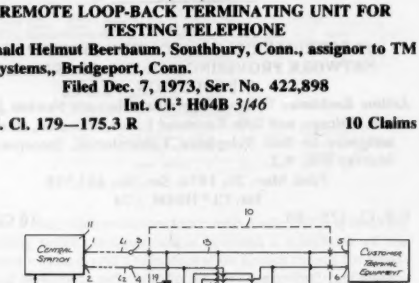
means for actuating said actuable bypass means when said scanner scans a preselected scan point so that the report for said preselected scan point is applied directly to said transmission means.

3,912,882

REMOTE LOOP-BACK TERMINATING UNIT FOR TESTING TELEPHONE

Ronald Helmut Beerbaum, Southbury, Conn., assignor to TM Systems,, Bridgeport, Conn.

Filed Dec. 7, 1973, Ser. No. 422,898
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **10 Claims**



1. A remote loop-back terminating unit for testing the condition of a telephone loop extending between a central station and terminal equipment at a remote point, the unit being interposed between the remote end of the loop and the terminal equipment and comprising:

A. a switching network having a normal position and a test position, said network in the normal position connecting the remote end of the loop to the terminal equipment to render the unit effectively transparent to intelligence signals from said station conveyed over said loop, said network in the test position disconnecting said remote end of the loop from the terminal equipment whereby the loop is then independent of said equipment and it becomes possible at the central station to test said loop;

B. circuit means coupled to said loop to detect a check tone transmitted over said loop from said station when the switching network is in its normal position and to produce a control signal only when said check tone has a predetermined frequency and has a predetermined duration in excess of one second, said circuit means intercepting said check tone regardless of whether said terminal equipment is short circuited, open-circuited or grounded, said circuit means imposing a path across said loop whose impedance with respect to said intelligence signals and said check tone is relatively high and does not interfere with the transparency of said loop;

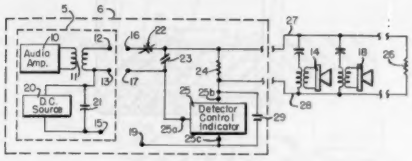
C. means responsive to said control signal and operatively coupled to said switching network to effect a transfer thereof from the normal position to the test position for a predetermined test period; and

D. means independent of said equipment operable only during said test period to render said loop effective for testing from the central station.

3,912,883
DIRECT CURRENT SUPERVISORY SYSTEM

Walter David Goodyear, Owen Sound, Canada, assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,872
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R 9 Claims



1. A supervisory system for supervising, at a central location, an information transmission system with at least one pair of line wires, said information transmission system including information source connected to said one pair of line wires, said supervisory system comprising,

means supplying direct current energy to said pair of line wires,

first resistive means connected across said pair of line wires remote from said central location,

second resistive means connected across said pair of line wires at said central location,

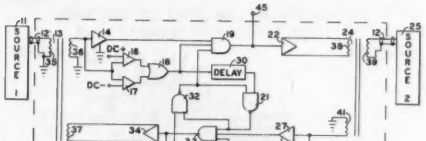
detector means at said central location responsive to the direct current on one of said pair of line wires and,

control means connected to said detector means operating in response to said detector means detecting a distinctive trouble condition on said pair of line wires for disconnecting said pair of line wires from said information transmission source.

3,912,884
COMMUNICATION MONITORING SYSTEM

Robert J. Membrino, Silver Spring, and James J. Ridgell, Jr., Elkridge, both of Md., assignors to The Singer Company, New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,389
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R 9 Claims



7. A system for monitoring information which is propagated by information sources through a medium in which information is sent, and determining from which source the information is being transmitted, said system comprising:

a. a transmission medium in which information is being propagated;

b. at least a first and a second transceiver coupled to said transmission medium, which transceivers receive, process, and transmit information;

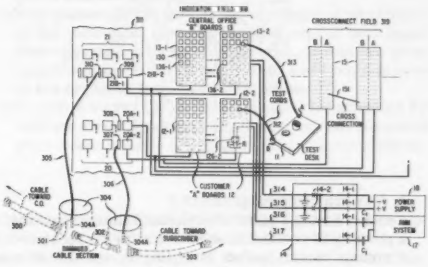
c. at least two means coupled to said transceivers, each of said means conveying the information transmitted by said transceivers in a predetermined direction; and

d. at least two devices coupled to said means to determine from which means information is being transmitted.

3,912,885
CABLE RESTORATION SYSTEM

Frederick Henry Koster, Granite Springs, N.Y., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,401
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 A 8 Claims



1. In a cable restoration system for temporarily providing service to telephone customers whose normal service has been interrupted by a break in a cable having a plurality of multiconductor bundles connecting said customers to their serving central office, an arrangement for decreasing the operating time of said system comprising,

a plurality of first restoration cables, each of said first restoration cables being respectively connectable to a multiconductor bundle at the customer-side of said break in said cable,

a plurality of second restoration cable, each of said second restoration cables being respectively connectable to a multiconductor bundle at the central office-side of said break in said cable,

an array of cross-connect terminals, said terminals being divided into a plurality of groups,

an intermediate connection panel wired to said array for temporarily connecting each of said terminal groups to one of said first and second restoration cables,

a plurality of first indicating means connected to said array of terminals for locating a conductor corresponding to a service-requesting customer in one of said conductor bundles associated with the customer-side of said break in said cable,

a plurality of second indicating means connected to said array of terminals for locating a conductor corresponding to the directory number of said service-requesting customer in one of said conductor bundles associated with the said office side in said break in said cable,

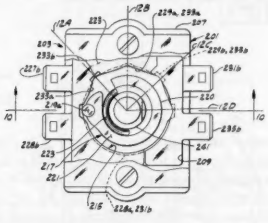
first visual identification means for directly associating one of said plurality of first indicating means containing said located customer conductor with one terminal group in said array,

second visual identification means for directly associating one of said plurality of second indicating means containing said located central office conductor with another terminal group in said array so that said temporary connections to said restoration cables can be rearranged to place said terminal group associated with said located customer conductor physically adjacent to said terminal group associated with said located central office conductor.

3,912,886
ROTARY SWITCH

James B. Allen, Richardson; Glen C. Shepherd, Garland, and Joe W. Crawford, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1973, Ser. No. 425,646
Int. Cl.² H01H 19/56
U.S. Cl. 200—11 A 11 Claims



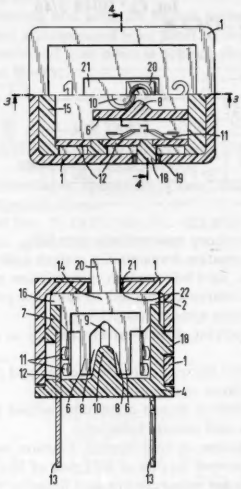
1. A switch comprising:
a socket having a generally cylindrical interior surface;
a plurality of conductive segments each having a generally arcuate contact surface extending around at least a portion of the interior periphery of said socket, said contact surfaces being arranged in parallel spaced layers extending perpendicularly to the central axis of the socket;
a rotor nested within said socket and rotatable around said axis, said rotor carrying contact means movable in a generally circular path around the inner periphery of the socket and adapted to bridge the spaced arcuate contact surfaces for a portion of its range of rotary movement;
means biasing said movable contact means radially outwardly against the contact surfaces and the exposed surface of the socket interior; and
notches formed in the interior periphery of said socket at positions corresponding to switching positions of said rotor, the contact means adapted to move into the notches upon registration therewith to enable the contact means to engage certain ones of the plurality of conductive segments as well as to provide indexing of the switch.

3,912,887
MINIATURE SLIDE SWITCH WITH SPLIT HOUSING AND DETENT STRUCTURE

Josef Gratz, and Kurt Muehlboeck, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 9, 1974, Ser. No. 486,878
Claims priority, application Germany, July 10, 1973, 2335039
Int. Cl.² H01H 15/06, 3/50
U.S. Cl. 200—16 D 11 Claims

1. A miniature slide switch, comprising:
a housing dish having side wall portions with at least one stationary contact on an inner surface thereof,
a saddle-shaped contact slide having at least one movable contact engageable with said stationary contact and having at least one elastic saddle side wall and being relatively movable along the side wall portions of said housing dish, to move at least one of said stationary and one of said movable contacts into and out of engagement with one another,
at least one protrusion extending from said housing dish into a space adjacent an interior surface of said side wall of said saddle shaped contact slide,
a complementary abutment surface on the interior surface of said side wall of said slide engageable with said protrusion, whereby flexure of said side wall of said slide can be effected to permit said abutment surface to pass around said protrusion upon movement of said slide from one position to another and whereby at least one of said stationary and one of said movable contacts can be moved into or out of engagement with one another by



movement of said abutment on one side or the other of said protrusion; and
a casing member having members engaging corresponding arresting members of said housing dish,

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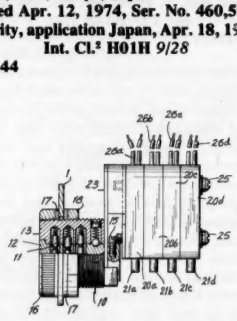
3,912,888
SWITCH LOCK ASSEMBLY

Tetsuo Takahashi, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,598
Claims priority, application Japan, Apr. 18, 1973, 48-43071
Int. Cl.² H01H 9/28
U.S. Cl. 200—44 1 Claim

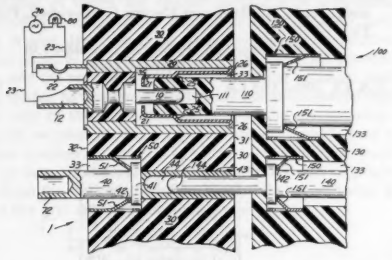


1. A switch lock assembly comprising one tumbler lock unit, a plurality of switches, said tumbler lock unit having an outer stationary barrel and an inner rotatable tumbler-equipped lock cylinder, and a key to be inserted through said lock cylinder, said switches being supported rearward of the outer barrel, actuators of said switches disposed in alignment on the same line parallel to the axis of the lock cylinder, said key having a rearwardly elongated portion projecting rearward of the outer barrel when inserted through said lock cylinder, said elongated portion having a longitudinal operating edge which drives at least one actuator to an operative position when the key is rotating said lock cylinder.

3,912,889
ELECTRICAL CONNECTOR HAVING AN INTERNAL SWITCH

Edward J. Bright, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 14, 1974, Ser. No. 442,564
Int. Cl. H01r *33/30*
U.S. Cl. 200—51.1 **4 Claims**

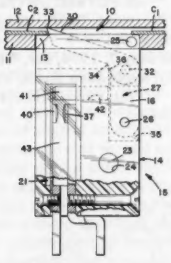


1. An electrical connector unit comprising:
an insulator having a plurality of bores therethrough extending from a forward face to a rear face;
a plurality of electrical contacts, each of said contacts mounted in a respective bore, each of said contacts having one end that extends from the rear face of said insulator;
a metal sleeve, electrically insulated from and coaxially mounted around one of said contacts, said sleeve having a terminal end portion which extends from the rear face of said insulator; and
at least one resiliently deflectable and electrically conducting member for connecting said sleeve and said one contact in electrical circuit relationship, said resiliently deflectable member having one end connected to said sleeve.

3,912,890
SENSING SWITCH HAVING RESILIENT FINGER SENSOR FOR DETECTING A DOCUMENT

Daniel D. Call, Sarona, Wis., assignor to Bacom, Incorporated, Sarona, Wis.

Filed June 12, 1974, Ser. No. 478,456
Int. Cl.² H01H *3/16*; **G06M** *7/00*
U.S. Cl. 200—61.41 **12 Claims**

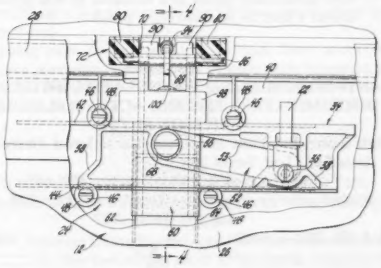


1. Apparatus for electrically sensing the presence of an object in a path of travel therefor comprising, in combination:
pivot means (**32**) defining an axis of rotation spaced from and orthogonal to the direction of said path;
link means (**31, 26, 35**) mounting said pivot means for resiliently opposed movement, out of an initial position, having a principal component aligned with said direction;
a gravity responsive finger (**30**) mounted on said link means for free pivotal movement about said pivot means in response to the force of gravity;
abutment means (**36**) limiting the movement of said finger in response to gravity, said finger and said abutment means being so configured that when said link means brings said pivot means into said initial position, said finger is positioned to protrude into said path for engagement by the leading end of an object traveling therealong to cause gravitationally opposed movement of said finger out of engagement with said abutment means accompanied by resiliently opposed movement of said pivot means out of said initial position;
release means (**25**) in the path of said finger at an extreme of the movement thereof for withdrawal of said finger from engagement by said leading edge, so that said pivot means may be resiliently returned to a rest position near to but displaced from said initial position;
and control means (**37, 40, 41**) mounted for actuation by said link means to perform a switching function when said pivot means is not in one of said initial and rest positions.

3,912,891
DOOR LATCH ASSEMBLY WITH VERTICALLY MOVED MICROSWITCH ENGAGED BY STRIKER

Robert L. Mercer, and Roger M. Boor, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1974, Ser. No. 494,092
Int. Cl.² H01H *27/00*
U.S. Cl. 200—61.67 **3 Claims**

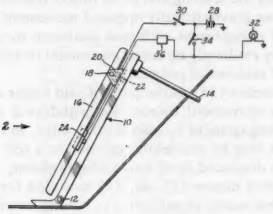


1. A latch assembly for a door having inner and outer spaced wall members comprising: an elongated slide member supported horizontally by one of said wall members; parallel track means on said door wall along which said slide member may move in a horizontal direction; a handle member attached at one end to said slide member and extending through said outer door wall member to manually impart movement to the slide member; said elongated slide member having an oblong opening therethrough characterized by parallel surfaces extending along said slide member at an angle of inclination with respect to the horizontal; a bolt member supported adjacent said slide member; parallel track means on said door wall along which said bolt member may move in a vertical direction; connecting means including a roller extending into said opening and attached to said bolt member to cause vertical movement of said bolt member when said slide member is moved in a horizontal direction; a striker assembly operably engaged by said bolt member when the latch assembly is in a closed operative mode to maintain the door in a closed position; said striker assembly including a pivotally mounted striker, one end of which is engaged by said bolt member when in a closed operative position to pivot its other end into engagement with said door wall and secure said door in a closed operative position; normally open switch means operably engaged by movement of said striker to its closed operative position thereby closing the switch means to permit the dishwasher controls to be activated.

3,912,892
AUTOMOBILE DECELERATION WARNING SYSTEM

Melvin D. Morehouse, 24240 Los Codona, Walteria, Calif. 90505

Filed Jan. 18, 1974, Ser. No. 434,376
Int. Cl.² H01H 3/14
U.S. Cl. 200—61.89 2 Claims



1. In combination with a conventional accelerator pedal mounted in an automotive vehicle by a first pivot means and having a connection to a carburetor of the vehicle:

a. an auxiliary pedal overlying and substantially coextensive with the accelerator pedal and actuable by a driver's foot;

b. a second pivot means, independent of and spaced from said first pivot means, pivotally mounting said auxiliary pedal on said accelerator pedal, the axes of said first and second pivot means being substantially parallel; and

c. switch means carried by said auxiliary pedal and engaging said accelerator pedal and actuable by the pressure of a driver's foot on said auxiliary pedal.

3,912,893
ANTI-INTRUSION, SELF REGULATING SWITCH WITH DISCRIMINATING, SENSING ACTUATOR INCLUDING SILICON PUTTY

Arie Stoler, Bat-Yam, Israel, assignor to Israel Aircraft Industries Ltd., Lod, Israel

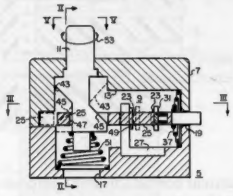
Filed June 7, 1974, Ser. No. 477,445
Claims priority, application Israel, June 11, 1973, 42470
Int. Cl. H01H 3/02
U.S. Cl. 200—61.93 12 Claims

1. An electrical switching device responsive to sudden movements of a movable member, comprising: a housing carrying the movable member; an electrical switch mounted within the housing and including a casing and a switch operator projecting therethrough; an actuator mounted within the housing and movable by the movable member to actuate the switch operator; and a flowable material between the movable member and the actuator, said flowable material being relatively free-flowing under a low stress but not under a high stress such that it effects a motion-transmitting coupling between the actuator and the movable member upon sudden movement of the latter to move the actuator sufficiently to actuate the switch operator, but upon slow movement of the movable member the flowable material effects a slip-coupling between the movable member and the actuator so that the actuator is not moved sufficiently to actuate the switch operator.

3,912,894
CONVERTIBLE SWITCH

John H. Mullen, and Walter J. Kellogg, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1974, Ser. No. 464,730
Int. Cl.² H01H 3/42
U.S. Cl. 200—153 LA 7 Claims

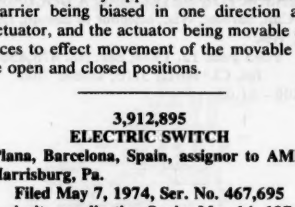


1. A convertible switch comprising an insulating housing, fixed and movable contacts movable between open and closed positions, mounting means mounting the movable contact between open and closed positions and comprising a contact carrier having a pair of spaced cam follower surfaces extending transversely to the direction of movement of the movable contact, a contact actuator having one cam surface on one side thereof and another cam surface on the other side thereof, the cam surfaces being operable on opposite sides of the contact carrier, the contact actuator being movable longitudinally to effect movement of the contact carrier, the one cam surface moving the contact carrier to one of the open and closed positions of the contacts when the actuator is moved in one direction, the other cam surface moving the contact carrier to the other of the open and closed positions of the contacts when the actuator is moved in the other direction, the contact actuator also being rotatable to turn the cam surfaces to diametrically opposite sides of the actuator, the contact carrier being biased in one direction against the contact actuator, and the actuator being movable against the cam surfaces to effect movement of the movable contact to one of the open and closed positions.

3,912,895
ELECTRIC SWITCH

Roberto Plana, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 7, 1974, Ser. No. 467,695
Claims priority, application Spain, May 14, 1974, 414752
Int. Cl.² H01H 1/18
U.S. Cl. 200—164 A 1 Claim



1. An electric switch comprising a housing of insulating material, a movable contact mounted in the housing and being formed as a resilient arcuate metal strip having a contact

surface formed on the convex surface of the arcuate strip adjacent a free end of the arcuate strip for contacting at least one stationary contact, and an actuator to which the arcuate strip is directly connected at its other end with the convex surface of the arcuate strip facing away from the actuator, the actuator being pivotably mounted in the housing and being movable by finger pressure between a first pivoted position in which the contact surface is in a position corresponding to disengagement with the stationary contact and a second pivoted position in which the contact surface is in a position corresponding to engagement with the stationary contact, said housing having two shoulders engageable with respective abutment surfaces on the actuator to define the first pivoted position and the second pivoted position of the actuator, said housing further having two similar guide members spaced one on each side of the path of movement of the arcuate strip, each guide member having a cam surface engageable with a respective portion on the arcuate strip, the guide members serving to cam the free end portion of the arcuate strip upwardly from the bottom of the housing while the actuator is between the first and second pivoted positions.

3,912,896

SWITCH AND TONER WITH UNIVERSAL SHAFT JOINT

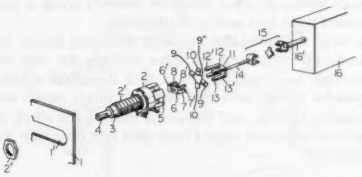
Masayoshi Imamura, Kawaguchi, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Sept. 14, 1973, Ser. No. 397,333

Claims priority, application Japan, Sept. 20, 1972, 47-108420

Int. Cl.² H03J *1/06*

U.S. Cl. 200—337 **3 Claims**



1. In combination, a first rotary adjusting means having a first adjusting shaft; a second rotary adjusting means having a second adjusting shaft; a coupling joint interconnecting said first adjusting shaft with said second adjusting shaft so said first adjusting shaft can be moved axially in all the different possible rotary positions thereof without moving the second adjusting shaft in a corresponding axial direction, said coupling joint comprising a first channel-shaped member secured to said first operating shaft for axial and rotatable movement therewith and having slotted axially extending sides, a coupling member having a first pair of aligned arms engaged within the slots in the sides of said first channel-shaped member so as to be rotatably and axially moved therewith and a second pair of aligned arms extending in a direction transversely to said first pair of aligned arms, and a second channel-shaped member connected to said second adjusting shaft and having axially extending slotted sides which axially slidably receive in slots therein said second pair of aligned arms of said coupling member so that the coupling member can be moved axially within said slots without imparting similar axial movement to said second channel-shaped member and adjusting shaft to which it is connected, the rotation of said coupling member by the rotation of said first channel-shaped member imparting a corresponding rotation to said second channel-shaped member by the force applied thereto through said second pair of aligned arms of said coupling member engaged therewith in the slots thereof; an on-off switch unit coupled to and operated by said first adjusting shaft and operable between circuit opening and circuit closing positions as said first adjusting shaft is moved axially between first and second axially spaced positions; and a tuning unit which is operable upon rotation of said second adjusting shaft.

3,912,897

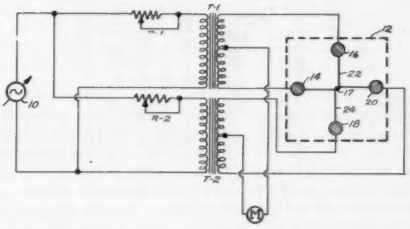
METHOD AND APPARATUS FOR WELDING ELECTRICALLY CONDUCTIVE WIRES

Arthur H. Willersdorf, Hampton, Va., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 14, 1973, Ser. No. 415,787

Int. Cl.² B23K *11/00*

U.S. Cl. 219—58 **6 Claims**



1. A method for welding electrically conducting wires together, comprising the steps of:

maintaining said wires in self-supporting contacting relationship at a junction point spaced from the ends of the wires; and

energizing each of said wires at its ends form a current source connected to said wires to raise their temperature to a level where molecular diffusion will cause the wires to coalesce at their junction point.

3,912,898

PROCESS FOR CHECKING AND ADJUSTING THE OPERATION OF AN ELECTRO-EROSION MACHINING APPARATUS

Jean Pfau, Geneva; Heinz Rhyner, and Georges-Andre Marendaz, both of Meyrin-Geneva, all of Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Continuation of Ser. No. 320,507, Jan. 2, 1973, abandoned. This application Apr. 11, 1974, Ser. No. 459,931

Claims priority, application Switzerland, Jan. 5, 1972, 152/72

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 M **8 Claims**

1. Method for monitoring and adjusting the operation of an electro-erosion machining apparatus, said apparatus comprising an electrical pulse generator for applying to a work gap between an electrode tool and a workpiece a series of electrical pulses causing electrical discharges to occur through said work gap immersed in an appropriate fluid, said method comprising:

monitoring at least a pair of selected machining conditions comprising presence or absence of abnormal electrical discharges and presence or absence of excessive fluid contamination until monitoring detects the presence of at least one abnormal condition;

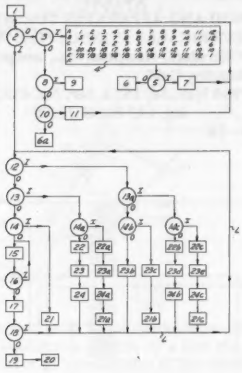
initiating a sequence of predetermined correction programs each correction program comprising a series of progressive increments for correcting the conditions observed during said monitoring and said sequence comprising the step of:

increasing the flow of fluid to said work gap,

increasing the time lapse between consecutive pulses, and

increasing the work gap between the electrode tool and the workpiece;

repeating said monitoring; and
initiating after each monitoring step each of said correction



programs until monitoring indicates the absence of defects in both selected conditions of operation.

3,912,899

STRAIGHTENING DEVICE FOR WIRE ELECTRODE USED IN AN ELECTRO-EROSION MACHINING APPARATUS

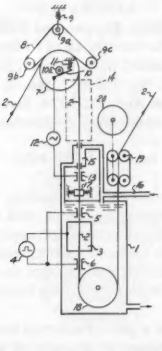
Hans Lehmann; Roger Girardin; William Morf, and Roger Delpretti, all of Geneva, Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Aug. 19, 1974, Ser. No. 498,654

Claims priority, application Switzerland, Aug. 24, 1973, 12181/73

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 V **6 Claims**



1. An apparatus for electro-eroding a workpiece by means of a wire electrode continuously fed at a predetermined velocity to the machining zone between a workpiece and said wire electrode, said apparatus comprising means for straightening said wire electrode by passing said wire through a heating zone in which said wire electrode is heated prior to feeding said wire electrode to the machining zone, means for subjecting said wire electrode during passage through said heating zone to a predetermined traction, means for cooling said wire electrode prior to feeding it through said machining zone, and means for increasing the traction exerted on said wire electrode while passing through said machining zone.

3,912,900

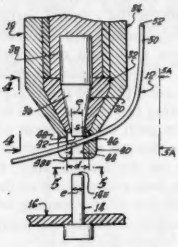
METHOD FOR FEEDING WIRE FOR WELDING

James C. Arnett, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 284,757, Aug. 29, 1972, Pat. No. 3,822,373. This application Apr. 29, 1974, Ser. No. 465,080

Int. Cl.² B23K *11/10, 11/22*

U.S. Cl. 219—91 **6 Claims**



1. A method for welding a wire to at least three terminals that are positioned out of line, comprising:
closely guiding a wire in extension across the width of the face of an electrode;
relatively moving the electrode with the wire extending across the electrode face, to successive terminals;
pressing the electrode face toward each terminal when it reaches the terminal, to press the wire against the terminal; and
passing welding energy through the electrode, wire, and each terminal, while the wire extends along a predetermined weld axis across the terminal;
said step of moving the electrode including lifting the electrode off each terminal after welding the wire thereto, moving the electrode in a first direction substantially parallel to the weld axis at the terminal which the electrode is leaving, and thereafter moving the electrode in a second direction angled from said first direction to a next terminal.

3,912,901

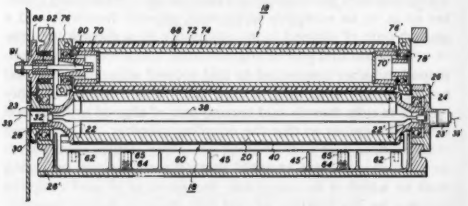
PFA TEFLON SLEEVED CHOW PRESSURE ROLL

Stephen Strella, Pittsford; George R. Imperial, Webster, and Joseph H. Moriconi, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 15, 1974, Ser. No. 488,378

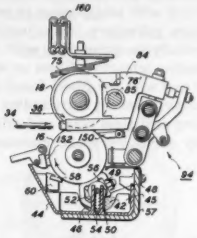
Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **8 Claims**



1. Fuser member for a roll fusing apparatus utilized in fixing toner images to support sheets, said member comprising:
a rigid core;
a layer of resilient material adhered to said rigid core; and

an outer layer over said resilient layer, said outer layer comprising a copolymer of perfluoroalkyl perfluorovinyl



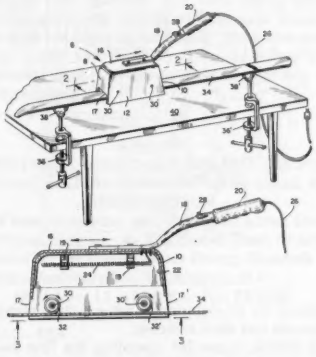
ether with tetrafluoroethylene, said ether having the formula $C_nF_{2n+1}—O—CF=CF_2$.

3,912,902

ELECTRICALLY HEATED TOURING SKI BASE WAX APPLICATOR DEVICE

Myron M. Herniter, 20 Regina Place, Yonkers, N.Y. 10703

Filed July 12, 1974, Ser. No. 488,206
Int. Cl.² H05B *3/02*
U.S. Cl. 219—228 **3 Claims**



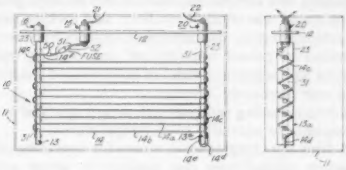
1. A touring ski base wax applicator device comprising, in combination, a housing having front and rear walls formed with bottom recessed portions, a pair of side walls, a top wall and an open bottom, an electrical radiant heating source in said housing for applying heat to a ski base, means for displacing said housing on a ski base, the recessed portions of the front and rear walls being of a width and depth sufficient to allow the side walls to overlap the sides of a ski when the device is placed thereon, said means for applying heat comprising an electrical resistance element mounted in said housing beneath said top wall and non-conductive spacers insulating said electrical resistance element from said housing/,/ , said means for displacing said housing comprising a pair of shafts secured to the side walls of said housing and a plurality of ski base engaging wheels rotatable on said shafts said wheels being located interiorly of the housing and positioned to engage the surface of the ski portion within the housing, the wheels having their outmost peripheral surfaces spaced above the lower edge of the side walls a distance greater than the thickness of the ski but less than the depth of the recessed portion of the front and rear walls, and a handle on the housing for manipulating the device.

3,912,903

ELECTRICAL HEATING DEVICE FOR AIR DUCT

Leonard L. Northrup, Jr., 4312 Westway, and James L. Northrup, Apt. 3212, 6021 Chalet Court, both of, Dallas, Tex. 75205

Filed Apr. 16, 1973, Ser. No. 351,486
Int. Cl.² H05B *3/02;* **H01C** *1/014*
U.S. Cl. 219—375 **5 Claims**



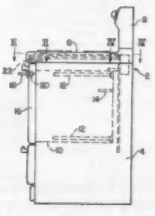
1. An electrical resistance-type heating device comprising: a mounting plate; spaced support bar assemblies secured at opposite ends of said mounting plate, each of said support bar assemblies having a conductor bar formed of an electrical current conducting material and a substantially flat, thin heating element mounting plate formed of a heat-resistant dielectric material secured to said conducting bar for supporting a heating element, the planar surfaces of said dielectric mounting plate being aligned in a direction parallel with the line of air flow past said heating device for providing minimum air resistance to air flow along said dielectric plate; a heating element formed of a straight electrical resistance type conductor shaped in a modified helix pattern having a plurality of straight sections interconnected at opposite ends of said heating element by curved turn sections whereby said straight sections are aligned in two spaced parallel planes, said straight sections in one of said planes being misaligned from said straight sections in the other of said planes, said heating element being mounted on said dielectric plates of said mounting bar assemblies, said straight sections of said heating element in one of said planes extending between corresponding edges of said dielectric plates while said straight sections in the other of said planes extending between the opposite corresponding edges of said dielectric mounting plates, said turn sections of said heating element encompassing the outside plane surfaces of said dielectric plates in spaced relation thereto whereby said mounting bar assemblies lie within said heating element at opposite ends thereof; and conductor means connected through said mounting plate to opposite ends of said heating element for supplying electric current to said heating element.

3,912,904

SELF-CLEANING OVEN LATCH-LOCK-CONTROL ARRANGEMENT

Clarence G. Phifer, Columbia, S.C., assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Dec. 24, 1974, Ser. No. 536,057
Int. Cl.² F27D *11/02*
U.S. Cl. 219—413 **4 Claims**



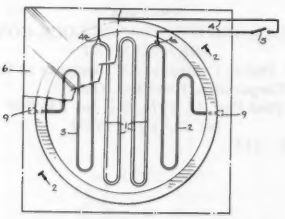
1. In a cooking oven of the pyrolytic self-cleaning type for carrying out both cooking operations and cleaning operations,

including an oven cavity defined by an oven liner;
heating means for said oven cavity;
a door for said oven cavity;
means for latching said door along its upper edge including a latching bolt movable into an aperture of a keeper plate; a bell crank pivotally mounted on said keeper plate, said crank including one arm adapted to be moved sideways by said latching bolt to turn said crank, and another arm movable forwardly upon turning of said crank;
a locking and control mechanism box located generally at the upper rear of said oven liner, said locking mechanism including a draw bar movable forwardly to control switch means to permit initiation of self-cleaning cycle, said draw bar including a series of holes spaced apart in a front to rear direction;
said box including safety switch means operable to open in response to excessive oven temperatures;
said draw bar carrying lever means for operating said safety switch means from one position in which said safety switch means operates to an open position in response to an oven temperature in excess of safe cooking temperatures, to a second position in which said safety switch means operates to an open position in response to oven temperatures in excess of safe cleaning temperatures;
a linking bar connected at its forward end to said another arm of said crank, and having at its rear connecting means for engagement with said draw bar at one of said holes therein;
a stabilizer bar having its front end attached at the pivotal axis of said bell crank, and having a series of front to rear attachment locations, corresponding in front to rear spacing to the spacing of said holes of said draw bar; and
means for making a connection between a selected one of said stabilizer bar attachment locations with a fixed location on said box, and for making an attachment between said rear connecting means of said linking bar with a corresponding hole of said rear draw bar, the correspondence between the stabilizer bar attachment locations and said rear draw bar holes being successively forward stabilizer bar attachment locations corresponding to successively rearward draw bar holes.

3,912,905
ELECTRIC RESISTANCE HEATING DEVICE

Roger Rolf Giler, Wilton, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Feb. 25, 1974, Ser. No. 445,053
Int. Cl.² H05B *3/68*
U.S. Cl. 219—464 **3 Claims**

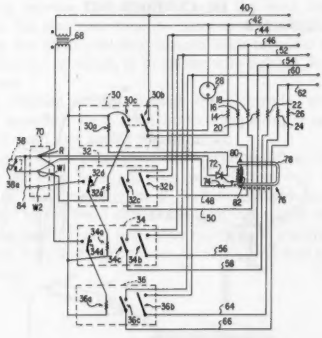


1. An electric cooking stove assembly comprising a flat glass plate forming a cooking surface area, a convoluted molybdenum disilicide wire forming a layer positioned substantially parallel with and below said plate and covering an area substantially co-extensive with said cooking surface area, said wire having opposite ends for connection with electric power and having at least one portion between said ends, which portion has a larger cross-sectional size than the balance of the wire, said wire forming a continuous circuit from one of its ends to its other end with said portion in series with the balance of the wire, a refractory body forming a flat surface extending substantially co-extensively with said layer of wire and having upstanding refractory fibers on which said layer of wire is supported and with the fibers fused to the wire, and a refractory annulus peripherally surrounding said layer of wire and interconnecting said glass plate and refractory surface so as to substantially enclose a space containing said layer of wire.

3,912,906
CIRCUIT FOR ELECTRIC HEATING SYSTEM

Harold A. McIntosh, and Bradford N. Hull, both of Los Angeles, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 24, 1974, Ser. No. 463,484
Int. Cl.² H05B *1/02*
U.S. Cl. 219—486 **8 Claims**

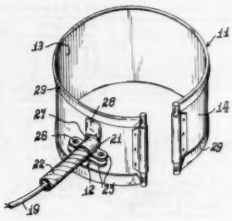


1. A circuit for an electrical heating system comprising first, second and third switches,
control switch means for operating the first switch, said control switch means having a control electrode which when energized operates the control switch means,
means for operating the second switch a predetermined duration after the operation of the first switch,
means for operating the third switch a predetermined duration after the operation of the second switch,
first and second heating elements connected to the respective second and third switches to be energized when the respective second and third switches are operated,
fluid moving motor means operated by operation of the first switch for moving a fluid medium over the first and second heating elements,
a thermostat having contacts which are closed at temperatures below a selected temperature and open at temperatures above the selected temperature, said contacts connected to the control electrode for energizing the control electrode when closed, and connected in series with the second switch operating means for sequentially terminating operation of the second switch operating means and the third switch operating means when open, and
means sensing energization of any of the first and second heating elements and connected to the control electrode for energizing the control electrode.

3,912,907
CLAMP AND MOUNTING ELECTRIC HEATER WITH A CABLE

Frank Lodi, Niles, Ill., assignor to Fast Heat Element Manufacturing Co., Inc., Elmhurst, Ill.

Filed July 19, 1974, Ser. No. 490,222
Int. Cl.² H05B 3/58
U.S. Cl. 219—535 **7 Claims**



1. An electric heater including an inside metallic wall and an outside metallic wall, an electric heating element between said walls, means insulating said heating element from said walls, an aperture in the outer wall, an embossment in said outside wall extending across and opening into said aperture, a cable extending through said aperture and electrically connected to said heating element, a clamp surrounding said cable adjacent said aperture, said cable being electrically insulated from said walls and said clamp, said clamp having securing means for engaging said cable, and a foot portion on said clamp nested and limitedly slideably movable in said embossment for resiliently connecting said electric cable to said heating element.

3,912,908
ELECTRIC CARTRIDGE-TYPE HEATER FOR PRODUCING A GIVEN NON-UNIFORM AXIAL POWER DISTRIBUTION

David L. Clark, Knoxville, and Tommy S. Kress, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

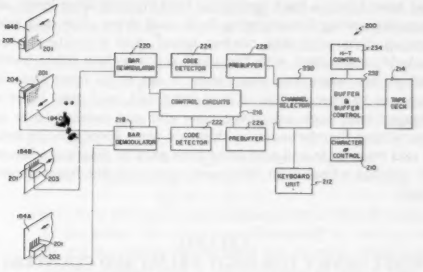
Filed Nov. 12, 1974, Ser. No. 523,183
Int. Cl.² H05B 3/10
U.S. Cl. 219—553 **1 Claim**

1. An electric cartridge heater for simulating a reactor fuel element for use in safety and thermal-hydraulic tests of model nuclear reactor systems comprising a specifically-shaped strip of metal provided with a variable width, a mandrel, said strip of metal being spirally wrapped around said mandrel with a constant gap between the spirals and provided with electrical end terminals to thus provide a coiled heater element of a desired length and diameter with the width of said coiled heater element being the smallest in the center portion of its length and getting gradually wider toward each end thereof with the ends thereof having the greatest width, and a housing enclosing said coiled heater element and insulated therefrom, whereby said coiled element is characterized by an electrical resistance that varies along its length due to variations in strip width to provide a simulation of the nonuniform (chopped cosine) power distribution of a reactor fuel element when said heater is energized for a simulated test operation.

3,912,909
RECORD READING APPARATUS

Richard A. Harrison, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 5, 1973, Ser. No. 321,373
Int. Cl.² G06K 7/10, 19/06; B07C 5/10; G11B 5/74
U.S. Cl. 235—61.11 R **26 Claims**



1. A record reading apparatus for reading records encoded with a message on one side of the record in a position displaced from the cneter of the record so that the message can be disposed in one of four different positions relative to a path of movement of the record, said apparatus comprising

four record sensing means for sensing an encoded message on a record, two of said means being disposed on each side of the path of movement with the heads on opposite sides displaced from each other in a direction parallel to the record path of movement and with the heads on the same side displaced from each other in a direction transverse to the path of movement of the record,

first selecting means coupled to the four sensing means for selectively selecting the two sensing heads which are adjacent the record at any given moment,

two message translating means each coupled to a pair of sensing means including one sensing means on each of the opposite sides of the path of movement for providing signals representing an encoded message,

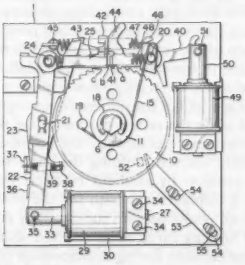
a message utilizing means, and

second selecting means coupled to the two message translating means for selecting one of the two translating means to supply signals representing an intelligible message to the message utilizing means.

3,912,910
STEP-FEED DEVICE

Shikanosuke Ochi, Tokyo, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

Filed May 7, 1974, Ser. No. 467,824
Claims priority, application Japan, June 18, 1973, 48-71183
Int. Cl.² G06M 1/32
U.S. Cl. 235—92 C **1 Claim**



1. A step-feed device characterized in that said device comprises a ratchet wheel rotatably supported with a pivot on

a base plate, a reset spring for biasing said ratchet wheel in its reset direction, a drive lever rockably supported with a pivot on said base plate, a drive claw pivotably supported by said drive lever so as to be freely rocked and having a tip end engageable with said ratchet wheel, a feed coil for rocking said drive lever, a reset lever rockably supported with a pivot on said base plate and provided with a locking claw engageable with said ratchet wheel at its tip end, a reset coil for rocking said reset lever, a back spring for backing said drive lever, an engaging spring for engaging both said drive claw and said locking claw with said ratchet wheel, and a holding lever rockably supported with the same pivot as said drive lever; and in that when said reset lever is set at its reset state in response to energization of said reset coil, said reset lever is engaged with both said drive claw and said holding lever as intervening therebetween so that said reset lever may be held at said reset state and said drive claw may be disengaged from the ratchet wheel even after said reset coil has been denergized.

3,912,911
RESET DEVICE FOR DIGIT DRUMS AND COUNTERS

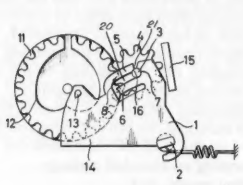
Hans Günter Krauss, Vohrum, Germany, assignor to ELMEG Elektro-Mechanik GmbH, Peine, Germany

Continuation-in-part of Ser. No. 325,393, Jan. 22, 1973, Pat. No. 3,835,303. This application Apr. 1, 1974, Ser. No. 456,835

Claims priority, application Germany, Apr. 13, 1973 2318703

Int. Cl.² G06C *15/42*

U.S. Cl. 235—144 HC **7 Claims**



1. In a reset device for resetting the digit drums of a counter having transfer pinions carried on a common shaft and normally engaging the digit drums for counter operation, the reset device including reset fingers operated upon advance of the reset device for returning the digit drums to a reset position, a resilient element for holding the shaft in the position wherein the pinions engage the digit drums and being displaced upon advance of the reset device for carrying the shaft and causing the pinions to disengage from the drum, a stop being stationary relative to displacement of the resilient element and of the pinion shaft for retaining the pinions in a disengaged position while the reset device and resilient element continue to advance, the shaft being shifted in the resilient element to a second position during the continuing advance of the element, the shaft being maintained in this second position in the initial phase of return of the reset device and of the resilient element upon retraction of the reset device, the shaft being shifted in the resilient element to its initial position upon re-engagement of the digit drums and of the pinions following the initial phase of return and while the return motion of the resilient element and of the reset device continues, the improvement comprising, the resilient element holding the shaft when in the first and second position by resilient reaction transverse to the extension of a displacement path for the shaft between said first and second positions with substantially constant resilient reaction and holding force being exerted also upon the shaft by the resilient element during displacement of the shaft along said path in that the total transverse resilient reaction on the shaft varies only insignificantly for the various positions of the shaft as between the first and second positions along said path.

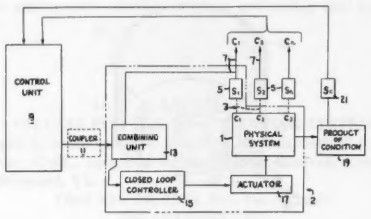
3,912,912
CONTROLLED MANUFACTURING PROCESS

E. Kears Pollock, Allison Park, and Forrest K. Umbel, Verona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 224,110, Feb. 7, 1972, Pat. No. 3,779,731. This application Sept. 14, 1973, Ser. No. 397,506

Int. Cl.² C03B *05/24*

U.S. Cl. 235—150.1 **2 Claims**



1. In the method of controlling a physical system by adjusting a selected condition thereof in response to other conditions thereof, the conditions of the physical system being respectively represented by corresponding condition signals; wherein a plurality of servo loops are controlled to control the physical system; the control of each servo loop comprising detecting the value of an individual system condition to be controlled, comparing the detected value of the system condition with a standard, responsive to said comparison generating a control signal and responsive to the control signal controlling the system condition by controlling an actuator acting upon the physical system; the improvement whereby selected servo loops are adjusted comprising:

a. establishing for each of the controlled system conditions a plurality of likelihood factors and generating a representative signal for each likelihood factor, each representing that a detected value of the selected system condition is a result of one of a plurality of causes when the detected value of each of the controlled system conditions deviates from its standard;

b. detecting the value of the selected system condition and responsive thereto generating a signal representing a probability factor for each of the plurality of causes;

c. comparing the detected value of each of the controlled system conditions corresponding to the selected system condition which is detected with its standard and responsive thereto generating a signal representing its established likelihood factor of each of the plurality of causes;

d. iteratively combining each of the signals representing each probability factor with each signal representing the likelihood factor corresponding to it for each detected value of each controlled system condition and thereby generating a signal representing the iterative product of said combining;

e. selecting the signal representing the iterative product of said combining which is most disproportionate from the signal initially generated in (b);

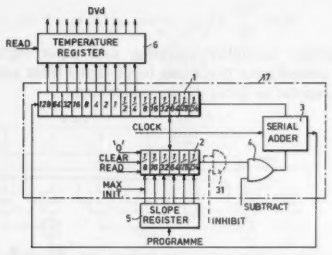
f. comparing the most disproportionate signal so selected with a signal representing a predetermined damping standard and generating a control signal responsive thereto;

g. adjusting, in response to said control signal, the servo loop of said plurality of servo loops having the most disproportionate likelihood factor signal for the selected most disproportionate signal wherein the remaining servo loops of said plurality of servo loops are permitted to remain unadjusted responsive thereto, whereby the control of the physical system is stabilized by the elimination of extraneous control actions.

3,912,913
PROCESS CONTROL METHOD AND APPARATUS

James William Bunting, Leamington Spa, England, assignor to Courtaulds Engineering Limited, Coventry, England

Filed Apr. 8, 1974, Ser. No. 458,464
Claims priority, application United Kingdom, Apr. 9, 1973, 16865/73
Int. Cl.² G05B 11/01, 19/02
U.S. Cl. 235—150.1 11 Claims

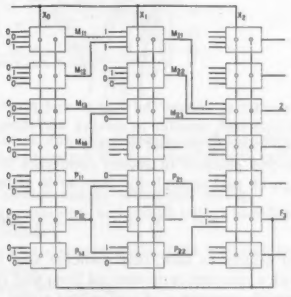


1. A method for controlling changes in the value of a process variable including the steps of producing electrically a digital number signal representing the desired value of the variable, adding to that number at successive equal intervals of time the positive or negative digital number representing the magnitude of a required change in the variable, to produce an updated desired value signal, and comparing the latter signal or an analogue of it electrically with a signal representing the measured value of the variable to obtain a control signal for regulating the value of the variable.

3,912,914
PROGRAMMABLE SWITCHING ARRAY

Philip John Moylan, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1972, Ser. No. 318,626
Int. Cl.² G06F 7/38; H03K 19/20
U.S. Cl. 235—152 4 Claims



1. Apparatus for generating signals representing desired sequential logical functions $Z_j, j=0, 1, 2 \ldots, (N_1-1)$ of one or more input logic variables $X_i, i=0, 1, \ldots, (N_2-1)$ comprising

a plurality of substantially identical logic modules arranged in a rectangular array having a plurality of ordered rows and a plurality of N_2 ordered columns, each of said logic modules comprising

a plurality of input terminals,

at least one output terminal, and

circuit means including delay means for generating at said output terminal, signals representing a fixed sequential function of logic variables represented by signals applied at said input terminals,

means for applying signals representing one or more of said input logic variables to selected modules in the first row of said array, said means for applying comprising

means for applying signals representing the ith input logic variable to an input terminal of the module in the first row of the ith column, said apparatus further comprising means for extending the application of said signals representing the ith one of said variable to an input terminal of each module in said ith column,

connecting means interconnecting selected ones of said modules appearing in a given column, other than the last, to modules appearing in the immediately succeeding column, said connecting means extending from a given module in said given column only to selected ones of the set of modules in said succeeding column which set includes the module in the same row as said given module and those in consecutive adjacent rows, said circuit means in each of said logic modules comprising

means for generating at time $t+1$ the fixed function,

$$f_{i,0}\, X_i' + f_{i,1}\, X_i,$$

where X_i is the input variable X applied to the ith column of the array, X_i' is the complement of X_i, and $f_{i,0}$ and $f_{i,1}$ are the logical functions of one or more of the input variables other than X_0 each applied at time t, and

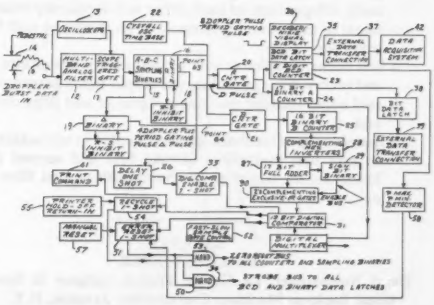
output means connected to selected ones of the modules in the last column of said array, said output means comprising

N_1 ordered output leads each connected to an output terminal of a respective one of said selected modules in the last column of said array, each of said output leads corresponding to one of said desired logical functions, and wherein at least one of said output leads is connected to an input terminal in each of the modules in the first row of said array.

3,912,915
DOPPLER DATA PROCESSOR WITH DIGITAL COMPUTING PULSE RATE FILTER

Henry T. Kalb, Manchester; Frank L. Crosswy; Jim A. McClure, both of Tullahoma; Edward B. Harding, McMinnville; Billy J. McClure, Tullahoma, and Donnie J. Inglish, Hillsboro, all of Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 1, 1973, Ser. No. 356,269
Int. Cl.² G01P 3/36
U.S. Cl. 235—152 2 Claims



1. A doppler data processor apparatus for processing frequency burst type data produced to a laser doppler velocimeter comprising in combination:

an analog filter unit to receive an output doppler data burst, said analog filter unit filtering said input doppler data burst to attenuate extraneous noise, said analog filter unit providing doppler burst data in response to said input doppler data burst,

a sampling unit connected to said analog filter unit to receive said doppler burst data, said sampling unit providing a D pulse and a Δ pulse signal of four and eight dop-

pler time periods respectively,
a time base unit to provide clock pulses, and
a digital pulse rate computing filter connected to said sampling unit to quantize the time interval of said D and Δ pulse signals, said digital pulse rate computing filter receiving said clock pulses to provide a time base, said digital pulse rate computing filter utilizing said time base and said time interval of said D and Δ pulse signals to establish predetermined doppler period limits, said digital pulse rate computing filter comparing the time interval difference between the D and Δ pulse signals with said predetermined doppler period limits, said digital pulse rate computing filter accepting valid doppler period data.

3,912,916

ELECTRICAL CURRENT FREQUENCY FILTER CIRCUIT HAVING PARALLEL FILTER BRANCHES

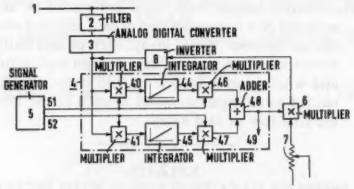
Artur Grün, Erlangen; Ernst-Robert Paessler, Tennenlohe, and Kurt Smutny, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1974, Ser. No. 455,893

Claims priority, application Germany, Apr. 2, 1973, 2316436

Int. Cl.² H03B *1/04*

U.S. Cl. 235—152 **14 Claims**



1. An electrical current frequency filter circuit, comprising:
first and second parallel coupled filter branches, each of said filter branches including a first multiplier, an intermediate frequency filter, and a second multiplier, respectively, coupled in series;
a first signal generator having first and second output terminals coupled to said first and second multipliers of said first and second filter branches, respectively, said signal generator generating two output signals which are linearly independent of each other at a frequency which is equal to that of an input signal to be passed by said filter branches;
a first adder, coupled to said second multipliers of said first and second filter branches, the output signal generated by said adder forming the output signal of said filter circuit; and
adjustable signal feedback means, coupled to said adder and to said first multipliers of said first and second filter branches, for adjusting the bandwidth of said filter circuit.

3,912,917

DIGITAL FILTER

Henri Nussbaumer, La Gaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,797

Claims priority, application France, Oct. 23, 1973, 73.38741

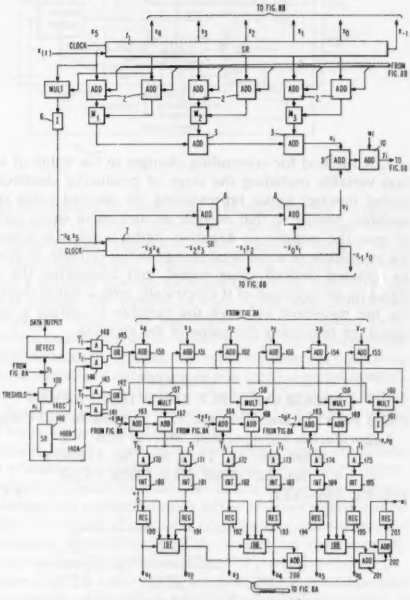
Int. Cl.² G06F *15/20*

U.S. Cl. 235—156 **2 Claims**

1. A digital filter of the type wherein each sample y of an output signal is derived from the sum of a plurality of input signals z each modified with one of a number of algebraic coefficients α, said filter including:
a first shift register to store digital signals representing successive samples of an information signal and providing said signals at intermediate and final outputs of said register;
a plurality of adders connected to the outputs of said first shift register and to signal sources representing said coefficients to weight said digital signals of said samples;
a number of multiplying devices each to receive the adder outputs representing an adjacent pair of said weighted samples;
adding devices connected to the outputs of said multiplying devices to generate a term

$$u_i = \sum_{0}^{N/2-1} (z_{i-2p-1} + \alpha_{2p+2})(z_{i-2p-2} + \alpha_{2p+1});$$

another multiplier receiving said input signal and the immediately preceding input signal from said first shift register to generate a product term;



an inverter to change the sign of said product term;
a second shift register to receive and store a sequence of said inverted product terms;
a second plurality of adders connected to the input and taps on said second shift register to generate a term

$$v_i = -\sum_{0}^{N/2-1} z_{i-2p-1} \cdot z_{i-2p-2}; \text{ and}$$

other adders to additively combine said terms u_i and v_i with a constant term derived from said coefficients α to provide samples y_i of said output signal.

3,912,918

LIGHT SOURCES EMPLOYING UNIVERSALLY ADJUSTABLE BALL AND SOCKET JOINTS

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,616

Int. Cl.² F21V *33/00*

U.S. Cl. 240—1.4 **7 Claims**

1. An auxiliary operating room light comprising:
a. a hollow socket having an internal groove about the inner periphery thereof,
b. a hollow ball member located within said socket and movable with respect thereto in a plurality of circular positions,

c. a light concentrating element including a lens located at a first smaller open end, said light concentrating element including a flared section having a central tapered aperture tapering from a large second open end to said smaller first open end, and having said smaller open end coupled to said ball member with said lens located within said central tapered aperture, said central tapered aperture permitting light rays from said lens to pass therethrough to provide illumination, and

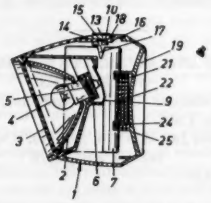
d. a beveled "O" ring seated and positioned in said groove to coact with and engage a peripheral surface of said ball for anyone of said positions, said "O" ring exerting a frictional force on said ball for maintaining the same in said position due to said beveled edge assuring coaction of said ring with said periphery of said ball including extreme circular positions.

3,912,919

BATTERY-OPERATED HAND LAMP

Albert Samuel Eriksson, Langakersgatan 16, S-442 00 Kungalv, Sweden

Filed May 21, 1974, Ser. No. 472,062
Int. Cl.² F21V *33/00;* **S16G** *11/00*
U.S. Cl. 240—6.4 W **7 Claims**



1. A portable self-contained electric lamp capable of being mounted around a person's head or other objects, comprising:
a casing,
a source of electric energy within said casing,
a light emitting assembly including a bulb, a bulb holder and reflector means,
switch means for connecting said bulb with said source of electric energy,
a lid for closing said casing,
a strap having one end thereof fixed to said lid,
wherein said lid further comprises:
retaining means for retaining a strap in a folded condition when not in use and means for adjustably holding said strap when said strap is used to mount said lamp to an object.

3,912,920

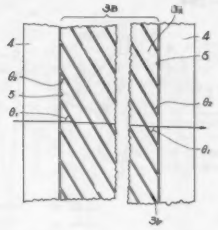
POLARIZED LIGHT ILLUMINATION DEVICE

Josuke Kubota, Rm. C-405, Mandai-higashi Apt., 2-17, Dai-ryo-cho, Sumiyoshi-ku, Osaka, Japan

Filed Feb. 6, 1974, Ser. No. 439,857
Int. Cl.² F21V *9/14;* **G02B** *5/30, 27/28*
U.S. Cl. 240—9.5 **5 Claims**

1. A polarizing device for polarizing light from a light source in the headlight of vehicles, comprising

a. a paraboloidal reflector behind the light source for forming a parallel beam with light from the light source;
b. a transparent laminated plate disposed in the path of the beam of parallel light, said plate comprising a plurality of transparent sheets having a material between the sheets, said material having a refractive index different from the refractive index of said sheets, each of said sheets being angularly disposed relative to the optical axis of the parallel light from the beam at an angle equal to the polarization angle so that the parallel light is refracted at the



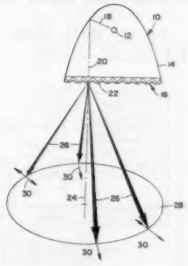
interface of the transparent sheets and the material and projected to the next transparent sheet at the polarization angle, said sheets each having surfaces at their edges, said surfaces being angular relative to the planes of the sheets, said surfaces forming a light penetration plane extending along a substantial majority of one side of said plate and an emergence plane extending along a substantial majority of the other side of said plate for the parallel light projected on said plate, said planes being substantially perpendicular to the optical axis of the parallel light.

3,912,921

LUMINAIRE HAVING A RADIAL POLARIZING STRUCTURE

James D. Howe, Rochester, and Eugene C. Letter, Penfield, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 28, 1974, Ser. No. 473,857
Int. Cl.² F21V *9/14*
U.S. Cl. 240—9.5 **11 Claims**

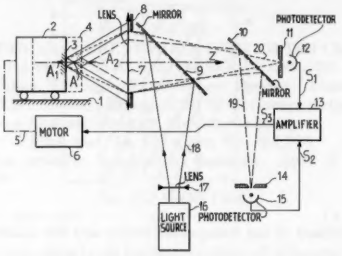


1. Luminaire apparatus, comprising:
illumination means for providing substantially collimated light;
radial polarizer means for linearly polarizing and radially distributing the collimated light having an axis of symmetry; and
refractor means for radially spreading the radially polarized light having an axis of symmetry, the axis of said refractor means being disposed substantially coincident with the axis of said polarizer means.

3,912,922
OPTICAL SENSOR FOR DETERMINING THE FOCUSSING ERROR IN AN OPTICAL ILLUMINATION SYSTEM EMBODYING A PROJECTION LENS

Jean Pierre Lacotte; Francois Le Carvennec; Jean Pierre Le Merer; Roland Malissin, and Jean Paul Peltier, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 14, 1974, Ser. No. 451,370
Claims priority, application France, Mar. 19, 1973, 73.09718
Int. Cl.² G01J 1/36
U.S. Cl. 250—204 8 Claims

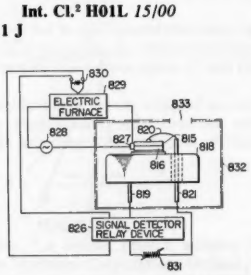


1. Optical sensor for determining the focussing error of an optical illumination system wherein a projection lens is used to focus a beam of radiant energy on a reflecting surface, said optical sensor comprising photodetector means having a predetermined detection area arranged for selectively receiving at least one radiant energy portion emerging from the illuminated portion of said reflecting surface and focussed by said projection lens in the form of a diffraction pattern; the body of said diffraction pattern being substantially equal to the detection area of said photodetector means; said optical sensor further comprising electrical means connected to said photodetector means for supplying a voltage representative of said focussing error.

3,912,923
OPTICAL SEMICONDUCTOR DEVICE

Hiroyuki Kasano, Akishima, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 212,430, Dec. 27, 1971, Pat. No. 3,745,423. This application June 13, 1973, Ser. No. 369,465
Claims priority, application Japan, Dec. 25, 1970, 45-130686
Int. Cl.² H01L 15/00
U.S. Cl. 250—211 J 6 Claims

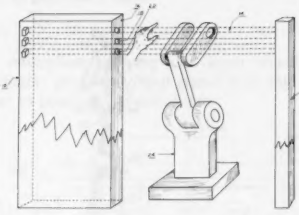


1. A semiconductor device comprising:
a germanium substrate;
a layer of $GaAs_{1-x}P_x$, wherein $1 \quad x \quad 0.3$, formed on said germanium substrate;
a pair of electrodes respectively disposed on said substrate and said layer; and
means, coupled to said electrodes, for providing an indication of the amount of light incident on said substrate, so as to form a light detecting cell.

3,912,924
MACHINE SAFETY CONTROL

James G. Barrett, Jr., Brentwood, Tenn., assignor to Link Electric & Safety Control Company, Kingston Springs, Tenn.

Filed Nov. 7, 1973, Ser. No. 413,398
Int. Cl.² G06M 7/00
U.S. Cl. 250—221 3 Claims

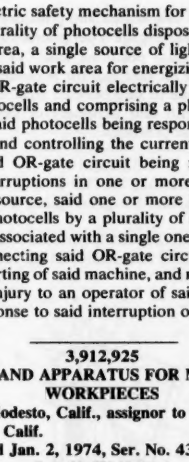


1. A photoelectric safety mechanism for machine operators comprising a plurality of photocells disposed at one side of a machine work area, a single source of light disposed on the opposite side of said work area for energizing said plurality of photocells, an OR-gate circuit electrically connected to said plurality of photocells and comprising a plurality of Darlington amplifiers, said photocells being responsive to said single source of light and controlling the current flow in said OR-gate circuit, said OR-gate circuit being responsive to and actuated by interruptions in one or more beams projected from said light source, said one or more beams being collimated to said photocells by a plurality of slots in a member each slot being associated with a single one of said photocells, and means connecting said OR-gate circuit controlling the stopping and starting of said machine, and means being operable to prevent injury to an operator of said machine by said machine in response to said interruption of said one or more beams.

3,912,925
METHOD AND APPARATUS FOR MACHINING WORKPIECES

Jesse Gaskell, Modesto, Calif., assignor to J & M Associates, Inc., Modesto, Calif.

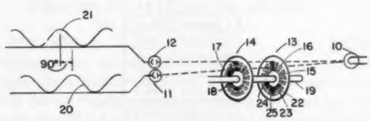
Filed Jan. 2, 1974, Ser. No. 430,346
Int. Cl. H01j 5/16
U.S. Cl. 250—227 30 Claims



1. Apparatus comprising
a machining tool;
means for generating light radiation at a location remote from said tool;
means for transducing said light radiation at a location remote from said tool;
optical fiber transmitting means for conducting said light radiation;
optical fiber receiving means for conducting said light radiation;
said transmitting means being coupled to said light generating means at one end and being open at its other end;

said receiving means being coupled to said transducing means at one end and being open at its other end;
said receiving means open end and said transmitting means open end being adjacent said tool and disposed relative to each other so that the light radiation conducted by said transmitting means emerges from its open end and is substantially directed to the open end of said receiving means;
a common support having aligned passages for supporting said open ends and having an open interior; and
said machining tool being disposed in said open interior between said passages for said transmitting and receiving means so that light radiation emerging from the open end of said transmitting means is substantially incident on said machining tool and occluded from entering the open end of said receiving means.

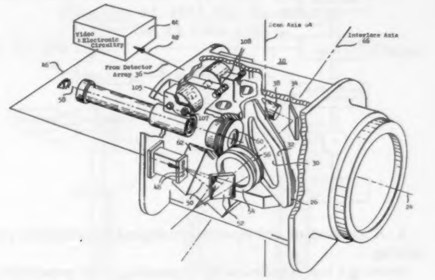
3,912,926
OPTO-ELECTRONIC INCREMENTAL ENCODER
Charles Coulbourn, Rolling Hills Estates, Calif., assignor to Los Angeles Scientific Instrument Co., Inc., Los Angeles, Calif.
Filed Oct. 18, 1974, Ser. No. 515,903
Int. Cl.² G01D *5/34*
U.S. Cl. 250—231 SE **4 Claims**



1. An opto-electronic incremental encoder comprising: a first disc stationarily mounted in an encoder body and a second disc, identical in design to said first disc, rotatably mounted on a shaft, the longitudinal axis of each disc coinciding with the longitudinal axis of said shaft, said first and second discs being positioned adjacent to each other; the first and second discs being provided with an identical outer annular arrangement of alternating transparent windows and opaque sections; the first and second discs being also provided with an identical inner annular arrangement of alternating transparent windows and opaque sections, the angular width of all transparent windows and opaque sections being substantially equal; light producing means mounted on one side of said first and second discs positioned to impinge beams of light on both said outer and inner annular arrangements of windows and opaque sections of said discs; a first photodetector means mounted in the encoder body on the opposite side of said first and second discs from said light producing means and positioned to receive light passing through the transparent windows of said outer annular arrangements of windows of said first and second discs; and a second photodetector means mounted in the encoder body on the opposite side of said first and second discs from said light producing means and positioned to receive the light passing through the transparent windows of said inner annular arrangements of windows of said first and second discs, the longitudinal axes of said first and second photodetector means intersecting a radius that is perpendicular to the longitudinal axis of said shaft.

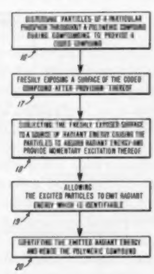
3,912,927
OPTO-MECHANICAL DEVICE FOR PHASE SHIFT COMPENSATION OF OSCILLATING MIRROR SCANNERS
Richard G. Hoffman, II, Allen, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 13, 1972, Ser. No. 305,763
Int. Cl. G01t *1/16;* **G02b** *17/00*
U.S. Cl. 250—234 **7 Claims**

1. An apparatus for scanning radiant energy comprising:
a. a radiant energy reflecting surface mounted for movement about a first and second axes, said first axis located less than 90° from said second axis;
b. means for rotating said radiant energy reflecting surface about said first axis, and for rotating about said second axis and for counter rotating said reflecting surface about said first axis;
c. detector means for receiving the radiant energy from said reflecting surface and producing an output signal that varies with the radiant energy incident thereon;
d. light source means responsive to said output signal for producing a visible light beam representative of said radiant energy, said visible light beam being scanned on the back surface of the radiant energy reflecting surface; and



e. means in the line of sight path to the back surface of the radiant energy reflecting surface operatively responsive to movement of the second axis for correcting lateral displacements appearing in the visible image produced by the radiant energy display system.

3,912,928
PERMANENTLY CODED POLYMERIC COMPOUND AND METHOD OF CODING AND IDENTIFYING SAME
James B. Rush, and Arthur D. Logan, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio
Filed May 6, 1974, Ser. No. 467,369
Int. Cl.² G01N *21/38*
U.S. Cl. 250—302 **25 Claims**

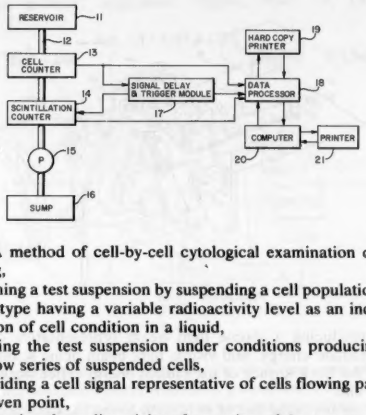


1. A method of permanently coding and identifying a particular polymeric compound using phosphor particles to provide the coding comprising the steps of, dispersing particles of a particular phosphor throughout said polymeric compound during compounding thereof to provide a coded compound, freshly exposing a surface of the coded compound after provision thereof, subjecting the freshly exposed surface to a source of radiant energy causing said particles to absorb said radiant energy to provide excitation thereof and allowing said excited phosphor particles to emit radiant energy which is identifiable, and identifying said emitted radiant energy to identify said particular phosphor and thus its polymeric compound.

3,912,929
CELL-BY-CELL CONDITION DETECTING

Carolus M. Cobb, and Martin Annis, both of Newton, Mass., assignors to American Science & Engineering, Inc., Cambridge, Mass.

Filed Dec. 10, 1973, Ser. No. 423,573
Int. Cl. G21h 5/02
U.S. Cl. 250—303 **19 Claims**



1. A method of cell-by-cell cytological examination comprising,

forming a test suspension by suspending a cell population of a type having a variable radioactivity level as an indication of cell condition in a liquid,

flowing the test suspension under conditions producing a flow series of suspended cells,

providing a cell signal representative of cells flowing past a given point,

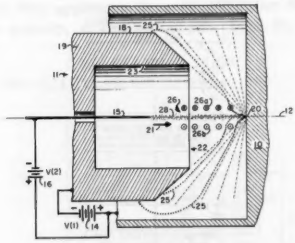
measuring the radioactivity of a portion of the test suspension comprising essentially one cell for a given period of time,

and recording the radioactivity during each given period of time to provide an indication of the radioactivity of each cell flowing past said given point.

3,912,930
ELECTRON BEAM FOCUSING SYSTEM

John Michael Creedon, and Sidney Darwin Putnam, both of Berkeley, Calif., assignors to Physics International Company, San Leandro, Calif.

Filed Sept. 26, 1973, Ser. No. 400,962
Int. Cl.² H01J 3/14
U.S. Cl. 250—398 **7 Claims**



1. An apparatus for focusing electrons comprising

means defining an evacuated housing,

an anode,

a first generally cylindrical cathode spaced apart from said anode, said cathode having means defining a hole therein, the axis of said hole being coincident with the axis of rotation of said cathode,

means for producing a first accelerating voltage to accelerate electrons emitted from said first cathode to relativistic velocities from said first cathode to said anode,

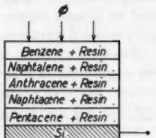
means for controlling the magnitude of electron current flow from said first cathode to said anode whereby the electric component of the electromagnetic field of said electon flow from said first cathode and the self-magnetic component of the electromagnetic field of said electron current flow from said first cathode are each of a magnitude and direction to cause said electrons to converge toward a common point generally along equipotential surfaces created thereby, and

means for creating a central electromagnetic field and current of electrons along a narrow path between said first cathode and said anode to control the point of convergence of said emitted electrons, said path being coincident with the axis of rotation of said cylindrical cathode and said hole.

3,912,931
PHOTOVOLTAIC DEVICE WITH LUMINESCENT LAYERS OF DIFFERING COMPOSITION

Philippe Edouard Leon Alexis Gravisse, 9, Residence Boieldieu, 92800-Puteaux, and Michel Prevot, 20, Rue Chartran, 92300-Neuilly, both of France

Filed June 14, 1974, Ser. No. 479,516
Claims priority, application France, June 15, 1973, 73.21890
Int. Cl.² F21K 2/02
U.S. Cl. 250—458 **10 Claims**

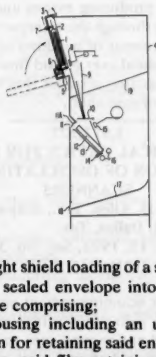


1. A photovoltaic device, comprising a photovoltaic cell of the junction diode type with a large surface for receiving radiation and at least one thin layer of a luminescent substance of the aromatic family coating said surface, said substance being so chosen that the response to spectral excitation of said substance is, on an average, situated lower, on the scale of the wavelengths, than the zone of spectral sensitivity of the photovoltaic cell alone.

3,912,932
DEVICE FOR LOADING FILMS INTO A RADIOGRAPHIC FILM CASSETTE

Takaaki Matsumoto; Takeshi Nakamura, and Kaoru Tamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 31, 1974, Ser. No. 438,516
Claims priority, application Japan, Jan. 31, 1973, 48-12589
Int. Cl.² G03B 41/16
U.S. Cl. 250—468 **7 Claims**



1. A device for light shield loading of a stack of radiographic film sheets from a sealed envelope into a radiographic film cassette; said device comprising;

a light proof housing including an upper film retaining housing portion for retaining said envelope in a generally upright position, said film retaining housing portion in-

cluding means for gripping the upper end of said envelope and cutting means for severing the lower end of said envelope, said gripping means being raisable to raise said severed envelope to expose the lower ends of said stacked films,

a cassette insertion port provided within said housing beneath said film retaining portion,

a light shielding cover movable between an open position and a closed position, carried by said housing, and urged in a direction to close off said cassette insertion port,

a film removal means carried by said housing for removing a film from said film retaining portion in accordance with a signal which indicates that the cassette is inserted,

a light shielding member for shielding light from the film removed from the film retaining portion,

a shutter mechanism provided on said light shielding member for causing the film to fall into the cassette by opening movement thereof, and

means for closing the cover of the cassette into which the film has been loaded.

3,912,933
FINE DETAIL RADIOGRAPHIC ELEMENTS AND EXPOSURE METHOD

Albert L. Van Stappen, Rumson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

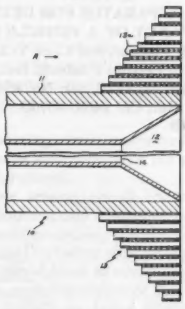
Filed Oct. 17, 1973, Ser. No. 407,165
Int. Cl. G03b *41/16*
U.S. Cl. 250—475 **8 Claims**

1. A radiographic element comprising a film support bearing a single silver halide emulsion layer and an antihalation layer, said silver halide emulsion having an average silver halide grain size of 0.4 to 1.2 microns, and an X-ray intensifying screen in contact with said emulsion layer, said emulsion layer and screen having a speed factor between 2.5 and 4.5.

3,912,934
VARIABLE FREE STREAM BUFFER

Bernard L. Iwanciow, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 25, 1974, Ser. No. 509,202
Int. Cl.² G01J *1/00*
U.S. Cl. 250—504 **7 Claims**

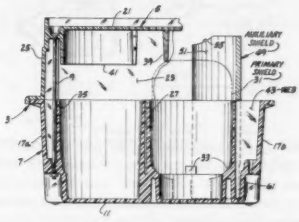


1. A combined infrared radiation source and free stream-buffer assembly, comprising; an airborne infrared radiation device emitting a plume of relatively low speed, hot gases constituting the specific infrared radiation source and surrounded by a relatively high speed, free stream flow; and free stream-buffer means attached to the outer periphery of said airborne device at the area thereof adjacent the base region of the plume of hot gases and extending radially outwardly into the path of the free stream flow, and incorporating built-in, open-ended and parallel-extending air passage means oriented in an upstream direction facing, partially entrapping and decelerating the relatively high speed, free stream flow to approximately the relatively slow speed flow of the plume of gases at the boundary therebetween to thereby substantially prevent the instability effect on the plume from the normal turbulent mixing of the free stream flow therewith, and therefore prevent a substantial reduction in the infrared intensity.

3,912,935
APPARATUS FOR ELUTING A DAUGHTER RADIOISOTOPE FROM A PARENT RADIOISOTOPE

Orval A. Harris, Webster Groves, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,331
Int. Cl. G01t *1/00*
U.S. Cl. 250—506 **2 Claims**



1. In apparatus for eluting a sterile daughter radioisotope from a parent radioisotope comprising a case having exterior walls, a generator including a supply of the parent radioisotope, a primary shield enclosing the generator for shielding against radioactive emissions from the parent radioisotope, means in the case for holding said primary shield in a predetermined position in the case, said primary shield holding means comprising an annular wall defining a compartment for reception of the primary shield, a generally vertical web extending between said annular wall and an exterior wall of the case with spaces on opposite sides of the web, the generator being adapted for flow of said eluant therethrough and into a container; an auxiliary shield of suitable radiation shielding material of generally the height of said primary shield and having an inner surface adapted to be disposed adjacent said annular wall on both sides of said web, said auxiliary shield having a slot therein for receiving said web whereby with the auxiliary shield positioned in the case adjacent the annular wall, and with the web received by the slot, the auxiliary shield is held by the web in position in the case for shielding the user from excessive radioactive emissions from the generator in the event the radiation emissions from the generator exceed the shielding capability of the primary shield, said auxiliary shield having an inner cylindrical surface of generally the radius of curvature of the outer surface of said annular wall, whereby said auxiliary shield is adapted to be positioned adjacent said annular wall, said case further having a bottom wall, end walls, and front and back side walls, said case further having a pair of interior walls extending up from the bottom wall and between the end walls, said annular wall and the compartment formed thereby being disposed between said interior walls, said web extending from said annular wall substantially parallel to said interior walls, and a second compartment extending up from said bottom between the interior walls for receiving means holding a supply of said eluant.

3,912,936
X-RAY IMAGE INTENSIFIER SYSTEM

Andrew Lees Cunninghame, Springdale, and Howard Grady Wagner, New Canaan, both of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Sept. 15, 1972, Ser. No. 289,691
Int. Cl. G21f *5/02*
U.S. Cl. 250—512 **14 Claims**

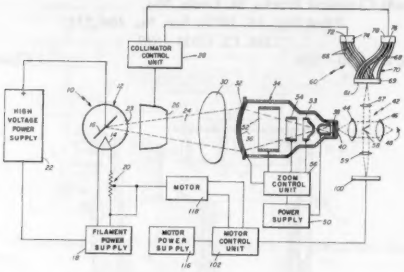
1. An improved X-ray imaging system including:

an X-ray generator having means for directing an X-ray beam through an externally located subject;

an X-ray collimator device operatively disposed between the X-ray generator and the subject and having adjustable means for regulating the cross-sectional size of the X-ray beam;

an X-ray image intensifier tube including an input screen disposed to receive an X-ray image of the subject and having means for emitting a corresponding electron image, an output screen having means for converting an incident electron image into a corresponding visual image, and means for focussing an electron image emitted by the input screen onto the output screen; and

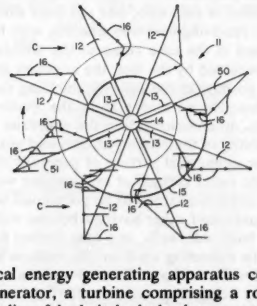
wherein the improvement comprises means optically coupled to the output screen of the image intensifier tube for monitoring the size of the visual image.



3,912,937
SUBMARINE ELECTRICAL ENERGY GENERATING APPARATUS

Jerome M. Lesser, 713 Parkway, Fultondale, Ala. 35068

Filed July 20, 1973, Ser. No. 381,077
Int. Cl.² F03B 13/10
U.S. Cl. 290—43 7 Claims

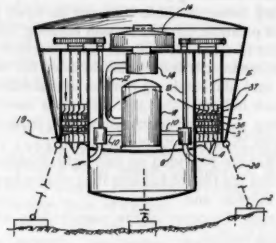


1. Electrical energy generating apparatus comprising an electrical generator, a turbine comprising a rotatable shaft having a plurality of dual pitched wheel vanes extending therefrom and louvers pivotally mounted on said vanes and so structured so as to be under the constant control of water current, each of said dual pitched vanes having at least one louver pivotally mounted on a first portion of each said vanes and at least one louver pivotally mounted on a second portion of each said vanes, such that whenever one of said vanes is moving from a point just below to a point just above the centerline of said shaft said louver on said first portion is closed, whereas said louver on said second portion is open, and whenever each of said vanes is moving from a point just above to a point just below the centerline said louver on said first portion is open, whereas said louver on said second portion is closed, and means operatively associated with said shaft and said generator for transmitting movement of the shaft to the generator.

3,912,938
ELECTRICAL STATIONS OPERATED BY WAVES

Gregory D. Filipenco, 158 Green St., New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,623
Int. Cl.² F03B 13/12
U.S. Cl. 290—53 3 Claims

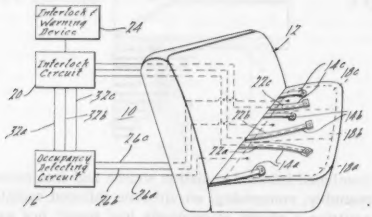


1. An electrical station, comprising a platform capable of floating upon the surface of water which produces waves, means connecting said platform to the water bottom and comprising a plurality of chains having ends connected with the platform and circumferentially spaced, a hydraulic drive carried by said platform, a generator connected with said hydraulic drive, and a device operable by the kinetic action of said waves and actuating said hydraulic motor, said device comprising a plurality of hydraulic turbines mounted in a circle upon the platform, each turbine having a container adapted to contain water, a vertical shaft in said container, wheels and blades connected with said shaft, another shaft located outside of said container, meshing gear wheels connecting the two shafts, and a delivery pump connected with said other shaft and having a water-receiving opening; a water accumulator located centrally in said platform, pipes connecting the delivery pump of each turbine with said water accumulator, said hydraulic drive being a centrally located hydraulic motor, and a pipe connecting said water accumulator with said hydraulic motor.

3,912,939
METHOD AND APPARATUS FOR DETECTING THE OCCUPANCY OF A VEHICLE SEAT

Norman G. Quantz, Algonac, and Chen Yi Lee, Troy, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Filed Apr. 1, 1974, Ser. No. 456,679
Int. Cl.² B62D 45/00
U.S. Cl. 307—10 SB 27 Claims



1. An apparatus for detecting the occupancy of a seat or the like by an occupant comprising:

generating means for providing a time varying signal;

reference capacitor means having a reference value of capacitance and operatively connected to said generating means to receive said signal;

conductor means also operatively connected to said generating means to receive said signal and mountable in asso-

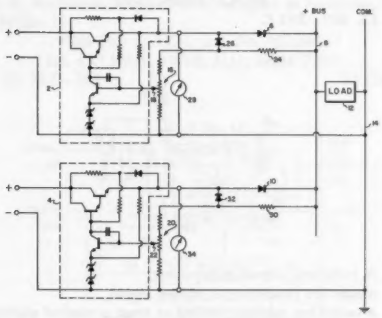
ciation with said seat so as to be in a position in the vicinity of said occupant, said conductor means being adapted to have a first value of capacitance when said seat is unoccupied and a second value of capacitance when said occupant occupies said seat; and

detecting means operatively connected with said reference capacitor and said conductor means for detecting the change of the value of capacitance of said conductor means from said first value of capacitance to said second value of capacitance by responding to the relative capacitance of said reference capacitor means and said conductor means to provide a signal representative of said occupancy.

3,912,940
DC POWER SUPPLY

John Vince, Lansdale, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 18, 1974, Ser. No. 507,258
Int. Cl.² H02J *9/00*
U.S. Cl. 307—64 **5 Claims**



1. A redundancy power supply apparatus comprising:

a first and a second regulating amplifier circuit, means including auctioneering diodes connecting said first and second regulating amplifier circuit in parallel to a controlled bus,

a first remote sensing circuit connected in feedback relationship between said controlled bus and said first regulating amplifier circuit,

a second remote sensing circuit connected in feedback relationship between said controlled bus and said second regulating amplifier circuit,

said remote circuits including adjustable means operative to establish the signal level at which said bus will be controlled and to establish control of that bus by that one of the first and second regulating amplifier circuits which first reaches rated output and to relegate the other amplifier circuit to stand-by condition,

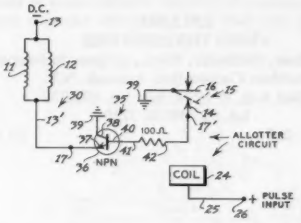
said remote sensing circuits each including a series resistance means connected between said bus and said adjustable means and a feedback limiting diode connected between an output terminal of the associated amplifier circuit and the junction between said series resistance means and said adjustable means whereby to maintain said amplifier circuit relegated to stand-by condition operative at a reduced output level,

and indicating means connected to said output terminals of said amplifiers to indicate the operation of the stand-by amplifier circuit.

3,912,941
ISOLATION CIRCUIT FOR ARC REDUCTION IN A DC CIRCUIT

Thomas M. Passarella, Rte. 4, Box 293, Arab, Ala. 35016

Filed Apr. 15, 1974, Ser. No. 460,794
Int. Cl.² H01H *9/30*
U.S. Cl. 307—136 **4 Claims**



1. In a direct-current circuit including a D.C. voltage supply having first and second poles, an inductive load having one side connected to said first pole, and make-break switch means having first and second electrical contacts and means for closing said contacts and for opening said contacts; means for isolating said load from said switch contacts comprising:

a. triode switch means having first and second power electrodes and a gate electrode,

b. means connecting said first power electrode to the other side of said inductive load,

c. means connecting said second power electrode to said second pole,

d. resistive gating means of predetermined value connected in electrical series with said second pole, said first and second contacts and said gate electrode,

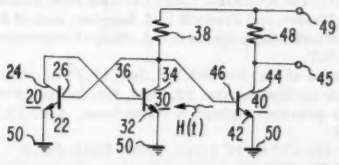
e. said resistive gating means impressing a sufficient voltage upon said gate electrode, when said contacts are closed, to bias said triode switch means in conduction with a minimum of current passing through the closed contacts;

f. said resistive gating means turning off said triode switch means, when said contacts are open, to shunt the back E.M.F. currents generated in the collapsing inductive load only through said power electrodes to isolate said load from said make-break switch contacts.

3,912,942
SIGNAL COMPARISON CIRCUITS

Robert Haynes Isham, Piscataway, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,543
Int. Cl.² H03K *5/20*
U.S. Cl. 307—232 **17 Claims**



1. In combination:

a circuit reference point;

first, second, third and fourth inverters, each having an input terminal, an output terminal and two power terminals, one power terminal of each inverter being connected to said reference point, the output terminal of the first inverter being connected to the input terminals of the second and third inverters, the output terminal of the third inverter being connected to the input terminals of

the first and fourth inverters, the output terminals of the second and fourth inverters for providing circuit output signals;

means for applying a first input signal to the other power terminals of the first and second inverters; and

means for applying a second input signal to the other power terminals of the third and fourth inverters.

3,912,943

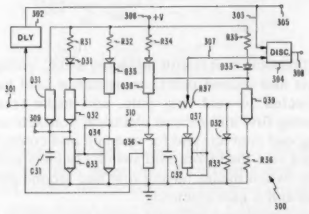
VIDEO THRESHOLDER

Melvin G. Wilson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,235

Int. Cl.² H03K *5/20*

U.S. Cl. 307—235 **12 Claims**



1. A thresholder for converting an analog video signal into a two-valued digital output signal, comprising:

delay means for producing a delayed signal from said video signal;

offset means for producing a delayed offset signal having a different absolute amplitude from said delayed signal;

follower means for storing a peak signal related to peak excursions of said video signal;

divider means for producing a threshold signal from said peak signal;

jump means for rapidly changing the amplitude of said threshold signal toward the amplitude of said video signal, when said video signal and said delayed offset signal bear a predetermined relation to each other;

discriminating means for producing a first value of said output signal when a signal derived from said video signal exceeds said threshold signal and for producing the other value of said output signal when said threshold signal exceeds said derived signal.

3,912,944

INTEGRATED BUCKET BRIGADE MEMORY USING TRANSISTOR BARRIER CAPACITORS FOR STORAGE

Cornelis Mulder, and Frederik L. J. Sangster, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

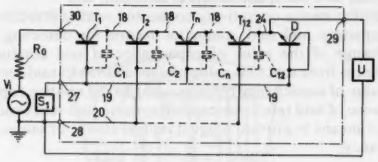
Continuation of Ser. No. 380,764, July 19, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,974

Claims priority, application Netherlands, Apr. 23, 1968, 6805704

Int. Cl.² G11C *11/34, 19/00;* H01L *29/78*

U.S. Cl. 307—238 **19 Claims**

1. An integrated memory, comprising a plurality of transistors each having a base, an emitter and a collector, the collector-base junction of a multiplicity of said transistors forming the major capacitor storage medium for storing signal current charge in a reversed bias condition of the base-collector junction, means for series connecting the emitter-collector paths of the transistors by connecting the emitter of each but a first transistor to the collector of a preceeding transistor in the series, a substrate provided with insulated semiconductor islands for supporting the transistors in the series, and means for conducting switching pulses into the base of each transistor in the series, whereby charge is transferred between the



capacitor storage medium of succeeding charge storage transistors in the series.

3,912,945

SWITCHING CIRCUIT

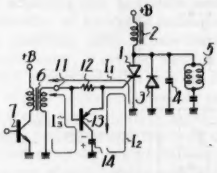
Yutaka Nakagawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 3, 1974, Ser. No. 502,646

Claims priority, application Japan, Sept. 7, 1973, 48-105053

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 C **3 Claims**



1. A switching circuit comprising;

a. means for producing a driving signal;

b. a switching element having at least a control electrode;

c. a biasing element connected between said driving signal producing means and the control electrode of said switching element;

d. a transistor having base, emitter and collector electrodes, the base-emitter path of said transistor being connected across said biasing element; and

e. a capacitor connected between the collector electrode of said transistor and a reference voltage.

3,912,946

AUTOMATIC-VOLUME-CONTROL SYSTEM FOR A-C SIGNALS

Rinaldo Graziadei, Monza, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Agrate Milan, Italy

Filed Oct. 21, 1974, Ser. No. 516,506

Claims priority, application Italy, Oct. 19, 1973, 30290/73

Int. Cl.² H03K *1/14*

U.S. Cl. 307—264 **6 Claims**

1. An automatic-volume-control system comprising:

a source of alternating-current signals;

rectifying means connected to said source;

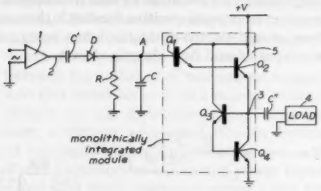
a time-constant network including a storage capacitor connected to said source through said rectifying means;

a first group of *n* cascaded transistors including a first pilot transistor and a first final transistor, n being an integer greater than one;

a second group of *n* cascaded transistors including a second pilot transistor and a second final transistor;

an operating circuit for said transistors including a direct-current power supply with two terminals, said first pilot transistor having an input electrode tied to said capacitor,

said final transistors being connected in tandem across said terminals and forming a junction, said second pilot transistor having an input electrode tied to said junction, corresponding transistors of said groups being of like



conductivity type and having substantially the same direct-current gain; and

a load circuit connected to said junction for differential energization by said final transistors with an attenuated replica of said alternating-current signals.

3,912,947

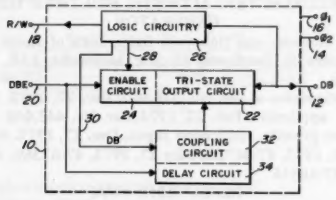
MOS DATA BUS CONTROL CIRCUITRY

John K. Buchanan, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 5, 1974, Ser. No. 485,698

Int. Cl.² H03K *19/08, 5/13;* **G06F** *7/00*

U.S. Cl. 307—269 **13 Claims**



2. A semiconductor circuit including a first control signal input, a second control signal input, a first conductor adapted to having an output signal coupled thereto, a data conductor within said semiconductor circuit adapted to having a data signal applied thereto, and logic circuitry coupled to said first control signal input for generating an internal control signal, said semiconductor circuit comprising data output circuit means coupled to said logic circuitry and to said first conductor and to said data conductor and to said second control signal input for actively holding a data signal on said first conductor during a cycle in which a first signal is applied to said first control signal input in response to an edge of a second control signal applied to said second control signal input and for allowing said first conductor to electrically float except during coincidence of said first control signal and said second control signal.

3,912,948

MOS BOOTSTRAP INVERTER CIRCUIT

Dilip C. Bapat, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 30, 1971, Ser. No. 176,128

Int. Cl.² H03K *3/281, 19/40*

U.S. Cl. 307—279 **4 Claims**

1. An MOS bootstrap inverter circuit, comprising:

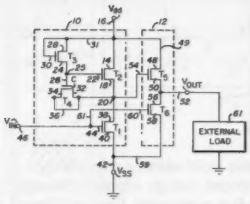
an inverter output node;

an inverting amplifier responsive to an input signal and operative to develop an inverted signal at said output node;

an active load means including, a first silicon gate FET having a first gate, a first source coupled to said output node, and a first drain for connection to a first source of potential;

biasing means coupling said first gate to said first drain; and

means comprising a silicon gate FET forming a capacitor and including a first body of semiconductive material of a first conductivity type having a first surface, a second body of semiconductor material of a second conductivity type disposed within said first body and terminating in



said first surface, an electrically conductive body disposed opposite a surface portion of said first body lying immediately adjacent to said second body, said conductive body forming a first plate of said capacitor, a dielectric layer disposed between said conductive body and said portion, means electrically coupling said conductive body to said first gate, and means electrically coupling said second body to said output node, whereby a predetermined difference in potential between said conductive body and said first body causes said portion to invert and form a second plate of said capacitor.

3,912,949

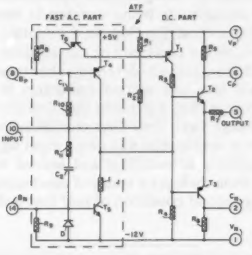
DRIVING CIRCUIT FOR PIN DIODE SWITCHES

Adri C. Kalisvaart, Providence, R.I., assignor to North American Philips Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,890

Int. Cl.² H03K *3/33*

U.S. Cl. 307—280 **3 Claims**

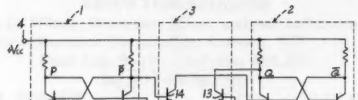


1. A driving circuit for PIN diodes switches comprising a fast a.c. drive part including a pair of transistors capacitively coupled to a source of input pulse signals for producing a current spike of one polarity in response to the leading edge of the input pulse and a current spike of opposite polarity in response to the trailing edge of the input pulse, discharging means coupled to each transistor for removing the charge stored in said transistors after the fall-time or the rise-time of the input pulse, and a d.c. d.c. drive part controlled by the output of said transistors to supply the bias direct currents for the PIN diodes.

3,912,950
BISTABLE MULTIVIBRATOR CIRCUIT

Masahiro Tada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,291
Claims priority, application Japan, Feb. 6, 1973, 48-15890
Int. Cl.² H03K 3/286
U.S. Cl. 307—289 6 Claims



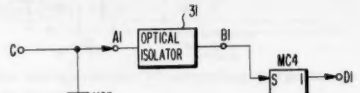
1. A bistable multivibrator comprising:
first and second voltage supply terminals;
a first flip-flop comprising first and second transistors each having first, second and control electrodes, the first electrodes of said first and second transistors being connected to said first voltage supply terminal;
at least a first common terminal having said second electrodes of said first and second transistors connected thereto;
at least one current source connected between said first common terminal and said second voltage supply terminal for supplying a clock input signal to said first common terminal to cause said first and second transistors to alternate between a first condition in which both are nonconductive and a second condition in which only one of said first and second transistors is conductive;
a second flip-flop comprising third and fourth transistors each having first, second and control electrodes, the first electrodes of said third and fourth transistors being connected to said first voltage supply terminal;
means connecting said second electrodes of the third and fourth transistors to said second voltage supply terminal; and
means coupling said first electrodes of said first and second transistors, respectively, to the control electrodes of said third and fourth transistors, respectively, said third and fourth transistors being alternately conductive and their states of conductivity being reversed in response to control from said first flip-flop, said coupling means being responsive to the condition of conductivity of said third and fourth transistors to determine the state of conductivity of said first and second transistors in said second condition such that, each time said first and second transistors change from their first condition to their second condition in response to said clock input signal, the states of conductivity of said first and second transistors are reversed from their prior states of conductivity during the preceding second condition of said first and second transistors.

3,912,951
OPTICALLY COUPLED CIRCUIT ARRANGEMENT

Kuniaki Kihara, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Apr. 19, 1974, Ser. No. 462,569
Claims priority, application Japan, Apr. 19, 1973, 48-43609
Int. Cl.² H03K 3/29; G02B 27/00
U.S. Cl. 307—289 1 Claim

1. An isolation network for first and second electric circuits, comprising:
a pair of electro-optical isolators, each isolator comprising a first optical coupler, first circuit means for coupling the input of said isolator in an operable relationship to the input of said first optical coupler, a second optical coupler, second circuit means for coupling the output of said first optical coupler in an operable relationship to the output of the isolator and to the input of said second optical coupler, the output of said second optical coupler being coupled to the input of said first optical coupler in a manner to provide positive feedback thereto, the input of one of said electro-optical isolators being connected to the output of said first electric circuit,

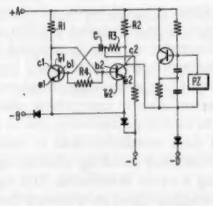


an inverter circuit connected between the output of said first electric circuit and the input of the other electro-optical isolator, and
a bistable circuit having two inputs connected to the respective outputs of said electro-optical isolators, the output of said bistable circuit being connected to said second electric circuit.

3,912,952
PIEZOELECTRIC ACOUSTIC MULTIPLE TONE GENERATOR

Osamu Kumon, and Nobuyuki Saito, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 318,967, Dec. 27, 1972. This application Feb. 22, 1974, Ser. No. 445,040
Claims priority, application Japan, Dec. 27, 1971, 46-2041; Apr. 20, 1972, 47-46728; May 27, 1972, 47-62369; Apr. 24, 1972, 47-48516
Int. Cl.² H01L 41/10
U.S. Cl. 310—8.1 1 Claim



1. A piezoelectric acoustic system comprising:
a. a single composite electroacoustical member including a piezoelectric element and a diaphragm adhered to each other;
b. phase-shift oscillator means electrically coupled to said member for applying electrical oscillation signals thereto, thereby inducing bending vibration in said member to generate a sound wave;
c. cross-coupled multivibrator circuit means comprising a resistance-capacitance time constant circuit which determines the switching frequency of said multivibrator means;
d. means for electrically coupling the output of said multivibrator circuit means to said oscillator means to intermittently interrupt said oscillation signals and thereby said sound wave; and
e. means for varying the resistance of said time constant circuit to vary the switching frequency of said multivibra-

tor means, and thereby the frequency at which said oscillation signals are intermittently interrupted so as to produce a plurality of distinguishable tone colors from said single composite member;

said multivibrator circuit further comprising first and second cross-coupled transistors of the same conductivity type; the collector of said first transistor being directly connected to the base of said second transistor to form a first cross-coupling path; said resistance-capacitance time constant circuit being connected between the collector of said second transistor and the base of said first transistor to form a second cross-coupling path; the emitters of said transistors being connected to a common point; a resistor connected directly between the bases of said transistors; individual resistors connecting the collectors of said transistors to a common power input terminal; first, second and third additional power input terminals connected respectively to said emitter common point, to the juncture of the resistance and capacitor in said time constant circuit, and directly to said oscillator means; whereby a D.C. power source selectively connected between said common power input terminal and individual ones of said first, second and third power input terminals produces, respectively, said plurality of distinguishable tone colors.

3,912,953

DEVICE FOR SOURCES OF PIEZOELECTRIC IGNITION

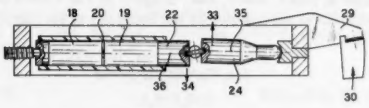
Pilutti Edoardo, Via Venezia 128, 33033 Codroipo, Italy

Filed Mar. 20, 1974, Ser. No. 453,033

Claims priority, application Italy, Mar. 20, 1973, 83339/73; May 24, 1973, 83376/73

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.7 **40 Claims**



1. A piezoelectric generator comprising:

a longitudinal housing framework,

at least one piezoelectric means supported within said housing framework for generating an electric charge in response to mechanical stress,

a rod-shaped member supported within said housing framework in alignment with said piezoelectric means along a longitudinal axis of said housing framework,

supporting means for pivotally supporting said piezoelectric means and said rod-shaped member in said housing framework,

means for providing movement of said piezoelectric means and said rod-shaped member from alignment on said longitudinal axis, such that compression forces are generated on said piezoelectric means, and

lever means for activating said means for providing movement.

3,912,954

ACOUSTIC ANTENNA

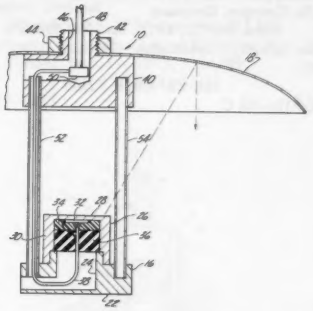
James D. Baird, Port Huron, Mich., assignor to Schaub Engineering Company, Downers Grove, Ill.

Filed Jan. 14, 1974, Ser. No. 433,218

Int. Cl.² H01L *41/10*

U.S. Cl. 310—9.1 **5 Claims**

1. An acoustic energy projector for use in level detection systems comprising: an acoustic wave source and a reflector spaced from the source along an axis of acoustic projection and having a focal point for collection energy from the source and directing such energy along a narrow beam path, the reflector being shaped to provide amplitude tapering for side lobe reduction, mounting means for disposing the source in spaced relation to and substantially at the focal point of the reflector and oriented to direct the acoustic wave produced thereby toward the reflector, said source comprising a housing having a flexural planar wall portion and an electrically excitable flexural transducer disposed in contact with said wall portion, said reflector being substantially parabolic in shape, the projector further comprising divider means disposed centrally within the reflector and having an acoustically reflective multiplanar surface for distributing the acoustic energy from the source outwardly into the parabolic reflector, said divider means further comprising a support means secured to the reflector, the mounting means comprising at least one hollow strut connected between the support member and the source, and electrical conductor means extending through the strut to the source for carrying an excitation signal thereto.



3,912,955

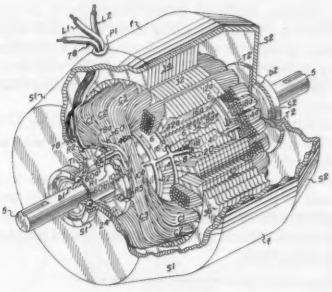
ELECTRIC DYNAMO

John R. Simpson, 3 Applecrest Road, Weston, Mass. 02193

Filed Nov. 19, 1973, Ser. No. 417,403

Int. Cl.² H02K *1/18*

U.S. Cl. 310—42 **9 Claims**



1. A dynamoelectric machine comprising a shaft, a rotor fixed thereto, a sectional stator having an inner stator and an outer stator, said rotor and shaft rotatably extending into said inner stator and said inner stator having exterior slots, first and second winding support means located at opposite ends of and connected to said inner stator, wire strands extending (a) from and between both of said winding support means and into said inner stator slots and (b) from and between two of said slots at one end of said inner stator and laterally in the form of a chord making contact with two different portions of said first winding support means, said two portions being spaced inwardly from the periphery of said first winding support means and being closer to said shaft than is the inner circumference of said inner stator, and a receiver extending over and in

contact with the outer surface of one of said winding support means, said receiver having slots for receiving the ends of said wire strands when the winding thereof is terminated.

3,912,956

DIRECT-CURRENT MOTOR

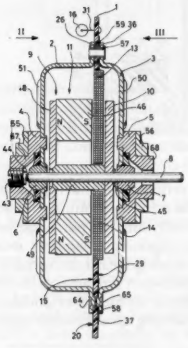
Rolf Muller, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed July 22, 1974, Ser. No. 490,670

Claims priority, application Germany, July 20, 1973, 2336955

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 C **12 Claims**



1. Collectorless d-c motor comprising:

a rotor shaft,

a permanent-magnet rotor including two rotor disks mounted for rotation with said rotor shaft,

a stator plate extending between said rotor disks,

flat motor coils attached to said stator plate,

two housing shells in facing relationship to one another which are attached along their respective edges to said stator plate with edge portions of said stator plate extending outwardly of said housing shells, said housing shells together forming a housing space enclosing said rotor and coils,

a plurality of circuit elements for said motor,

and flat conductor connections associated with said circuit elements,

some of said circuit elements being attached to said stator plate at positions inside said housing space and some of said circuit elements being attached to said stator plate at positions outside said housing space and spaced from said housing shells.

3,912,957

DYNAMOELECTRIC MACHINE STATOR ASSEMBLY WITH MULTI-BARREL CONNECTION INSULATOR

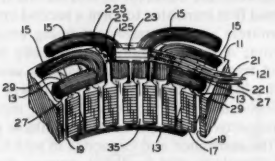
Hugh B. Reynolds, Rome City, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 27, 1973, Ser. No. 428,844

Int. Cl.² H02K *11/00*

U.S. Cl. 310—71 **4 Claims**

1. A stator assembly for use in a dynamoelectric machine comprising a magnetic core having coil accommodating slots therein and at least one core end face; winding means comprising at least two coils of winding material having side turn portions disposed in selected slots of the core and having end turn portions extending beyond the at least one core end face; at least one tap wire extending from at least two coils; at least two lead wires with a first lead wire portion connected to a first tap wire portion and a second lead wire portion connected to a second tap wire portion; and a multi-connection protecting insulator for insulating the connected portions of the lead wires and tap wires; said multi-connection protecting insulator comprising insulating material arranged to define a plurality of longitudinally extending insulating compartments; the connected portions of the first tap wire and first lead wire being disposed in a first one of the compartments, and the



connected portions of a second tap wire a second lead wire being disposed in a second one of the compartments; said multi-connection protecting insulator being formed of a sheet insulating material, and the first and second compartments being laterally separated from one another; the insulator includes a first tubular sleeve, and at least two insulating compartments are defined by second and third separate tubular sleeves, and the second and third separate tubular sleeves are disposed within the first tubular sleeve.

3,912,958

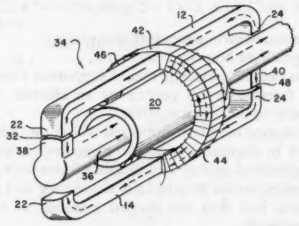
FLUX-SWITCHED INDUCTOR ALTERNATOR

Donald B. Steen, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,314

Int. Cl.² H02K *21/38*

U.S. Cl. 310—168 **5 Claims**



1. An inductor alternator comprising:

a rotor mounted for rotation about its axis, said rotor having two axially spaced radially extending toothed portions formed about the periphery thereof, each toothed portion including at least one tooth, each tooth of one of said portions having an associated tooth of the other portion oppositely disposed on the rotor periphery;

means for generating a magnetic flux in said rotor;

at least two elongated stator bars mounted concentrically of and parallel to said rotor axis, each of said stator bars being oppositely disposed of another of said stator bars to define an associated pair of stator bars, said stator bars being radially spaced from said rotor, each of said stator bars further having inwardly extending radial projections at the ends thereof, the ends of each of said projections confronting respectively one of said toothed portions on said rotor across a radial air gap;

at least one ferromagnetic flux annular ring disposed coaxially of said rotor, said ring being magnetically coupled to and supported by an associated pair of oppositely disposed stator bars; and

a plurality of solenoidal output coils wound radially about the cross-section of each annular ring;

whereby upon energization of said magnetic flux generating means, rotation of said rotor through at least one revolution causes the magnetic flux in each annular ring to alternately switch direction to thereby induce an alternating voltage in said output coils.

3,912,959

HIGH PRESSURE SODIUM VAPOR DISCHARGE LAMPS

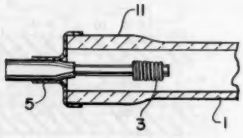
Akinori Muta, and Yasuo Tsukuda, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1973, Ser. No. 341,849

Claims priority, application Japan, Mar. 16, 1972, 47-26807

Int. Cl. H01j *61/30*

U.S. Cl. 313—220 **7 Claims**



1. A high pressure sodium vapor discharge lamp comprising:

a tubular elongated envelope of sintered polycrystalline yttria consisting of corrosion resistant yttrium oxide and having an average grain size of 0.1 to 5 mm, said envelope having a pair of electrodes sealed into opposite ends, and an ionizable medium including sodium vapor sealed within said envelope.

3,912,960

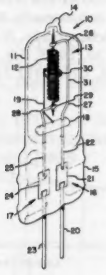
HALOGEN LAMP WITH INTERNAL MOLYBDENUM PARTS

George K. Danko, Bedford Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 21, 1974, Ser. No. 481,662

Int. Cl.² H01K *1/20, 1/50*

U.S. Cl. 313—222 **6 Claims**



1. A regenerative cycle incandescent halogen lamp comprising an envelope of vitreous material with at least one pinch seal, and a mount structure, said mount structure having outer lead-in wires connected to foils which are hermetically sealed in said pinch seal, inner lead wires connected to an incandescible tungsten filament at one end and to the molybdenum foils at the other end, said envelope being filled with an inert gas and a halogen gas selected from the group comprising iodine and bromine wherein the improvement comprises that the inner leads of the mount structure are made of a highly ductile molybdenum better than 99.95% molybdenum and having a minimum of 20% elongation.

3,912,961

ELECTRIC INCANDESCENT LAMPS

John Michael Rees, and Vivian Walter Goddard, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed July 25, 1974, Ser. No. 491,675

Claims priority, application United Kingdom, Nov. 28, 1973, 55230/73; Sweden, Dec. 11, 1973, 7316709

Int. Cl.² H01J *61/12*

U.S. Cl. 313—223 **12 Claims**

1. A tungsten-halogen cycle electric incandescent lamp comprising: a light-transmitting, high temperature-resisting envelope; a tungsten filament within said envelope; lead-in wires sealed through said envelope and connected to said filament; and a fill within said envelope capable of supporting a tungsten-halogen regenerative cycle in co-operation with said filament, said fill comprising a non-reactive gas, carbon, hydrogen, and halogen, said carbon hydrogen and halogen having been formed by dissociation of a solid, partially halogenated, aromatic halide within said envelope.

3,912,962

COLOUR PICKUP TUBE HAVING A FALSE SIGNAL PREVENTING FILM

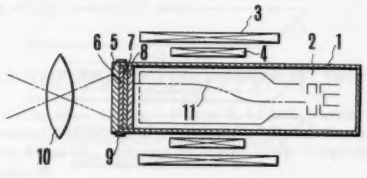
Samuro Nobutoki, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,460

Claims priority, application Japan, Apr. 11, 1973, 48-40456

Int. Cl.² H01J *29/36*

U.S. Cl. 313—371 **12 Claims**

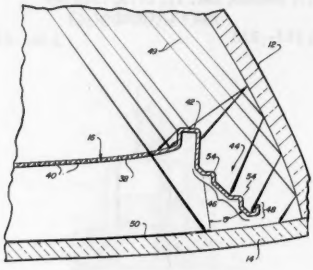


1. In a colour vidicon type pickup tube for use in single tube type or two tube type colour television camera systems comprising a transparent glass window, an optical colour analyzing stripe filter formed on the rear surface of said glass window, and a false signal preventing film made of a layer of transparent solid substance and formed on the surface of said filter, the improvement wherein said false signal preventing film is formed in such a manner that the periphery of said false signal preventing film is confined in a region defined by an outward extension of 5 mm from the periphery of said optical colour analyzing stripe filter and an inward spacing of 5 mm from the periphery of the same, said outward extension not touching the vacuum sealed portion of said glass window.

3,912,963
COLOR CRT HAVING SHADOW MASK WITH FORWARDLY DIRECTED, OUTWARDLY FLARED SKIRT

Stanley J. Sedivy, Chicago Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 7, 1973, Ser. No. 395,334
Int. Cl.[2] H01J 29/80
U.S. Cl. 313—402 14 Claims

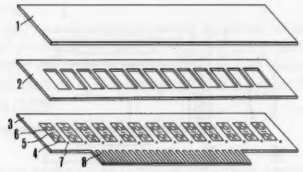


1. For use in a rectangular color cathode ray tube having a faceplate carrying phosphor screen, a generally rectangular, frameless shadow mask having a perforate curved central portion with its convex surface facing forwardly toward the faceplate when the mask is operatively mounted in the tube, and a forwardly directed skirt surrounding said central portion and flared outwardly at an angle corresponding substantially to the angle of maximum electron beam deflection, said skirt functioning to shield the screen from stray electrons and to impart rigidity to the mask.

3,912,964
MULTI-DIGIT DISPLAY APPARATUS

Masaharu Kouyama; Kusuo Nakada, both of Mobara; Toyokazu Odaka, Ichimiya, and Akio Miyamoto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1973, Ser. No. 384,887
Claims priority, application Japan, Aug. 4, 1972, 47-77701; Aug. 4, 1972, 47-77703; Aug. 4, 1972, 47-77706
Int. Cl. H01J 7/42
U.S. Cl. 313—519 1 Claim

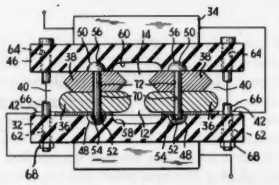


1. A multi-digit display apparatus comprising an electrode board having a plurality of display sections and a transparent plate which is transparent at least for portions facing the individual display sections, said transparent plate and electrode board being stacked, the stack being hermetically sealed around the periphery thereof, said electrode board carrying a plurality of cathode elements arranged in digit-8 groups for the individual display sections and anodes formed in portions surrounded by the individual cathode elements and in portions surrounding the individual cathode elements for each said digit-8 group, said anodes being commonly connected in each said display section and to a terminal for each said display section and corresponding cathode elements in each said display section being electrically connected with each other and to a terminal for each said element, the total area of the anodes in each display section being greater than the total cathode area in that section.

3,912,965
SPARK GAP DEVICE FOR LIGHTNING ARRESTER

Naoya Yamada; Nobuo Nagai, and Shoji Tada, all of c/o Central Research Laboratory of Mitsubishi Denki Kabushiki Kaisha, No. 80, Nakano, Minami Shimizu, Amagasaki, Hyogo, Japan

Continuation-in-part of Ser. No. 97,999, Dec. 14, 1970, Pat. No. 3,798,498. This application Feb. 1, 1974, Ser. No. 438,766
Int. Cl.[2] H01J 1/44, 17/04, 17/34
U.S. Cl. 315—36 25 Claims

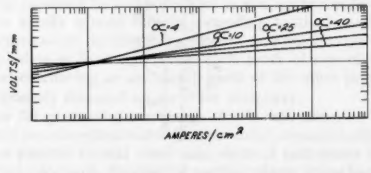


2. A spark gap device for a lightning arrester comprising: means defining a first spark gap having a uniform electric field characteristic; means defining a second spark gap connected in parallel with said first spark gap having a nonuniform electric field characteristic; a pair of driving electrodes disposed in parallel with each of said first and second spark gaps; means disposing said driving electrodes and said first and second spark gaps in an atmosphere of electrically negative gas, the gap distances of said first and second spark gaps being selected so that the discharge due to the lightning surge voltage always takes place across said first spark gap and that the discharge due to the slow wave voltage always takes place across said second spark gap.

3,912,966
INCANDESCENT LAMP SERIES STRING HAVING PROTECTION AGAINST VOLTAGE SURGES

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,898
Int. Cl.[2] H01J 17/34
U.S. Cl. 315—46 5 Claims



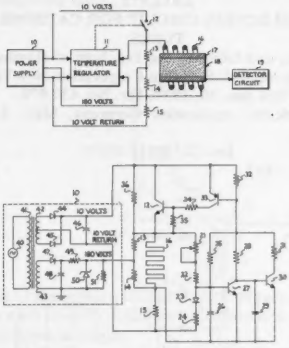
1. In a series string of incandescent lamps having a plurality of incandescent lamps therein, each said incandescent lamp having a filament, the improvement which comprises:

a plurality of bodies of polycrystalline varistor material, each said body being connected across a corresponding one of said filaments and electrically in parallel therewith for protecting said filaments against voltage surges by instantaneously decreasing impedance in response to increased voltage and by instantaneously increasing impedance in response to decreased voltage.

3,912,967
HEATER TEMPERATURE-REGULATING CIRCUIT FOR SENSOR OF HALOGEN LEAK DETECTOR

Daniel M. Longenecker, Waynesboro, Va., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,391
Int. Cl.² H05B *39/04*
U.S. Cl. 315—107 9 Claims



1. A circuit for energizing and regulating the temperature of a heater-anode of a gas sensor comprising:

a. a d-c heating voltage source;

b. electronic switch means connected in series with the d-c voltage source and the heater-anode; and

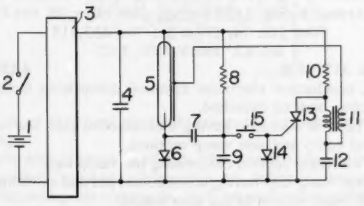
c. circuit means, connected in circuit with the heater-anode, responsive to the d-c voltage developed across the heater-anode for opening the switch whenever the heater-anode voltage increases above a predetermined value,

d. said circuit means comprising a voltage divider network having a first resistor (**32**) connected in series with a parallel circuit including a second resistor (**28**) in series with a first transistor (**27**) in one leg of the parallel circuit and a third resistor (**31**) in series with a second transistor (**30**) in another leg of the parallel circuit, said first transistor being connected to bias the second transistor to a less conductive state in response to the heater anode voltage increasing above said predetermined value.

3,912,968
FLASH TUBE DISCHARGE-PRODUCING CIRCUIT

Zenzo Nakamura, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,251
Claims priority, application Japan, Aug. 7, 1972, 47-78978
Int. Cl.² H05B *37/00*
U.S. Cl. 315—241 P 7 Claims

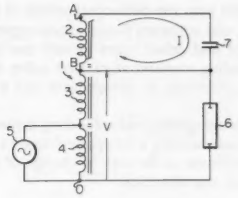


1. A flash discharge-producing device comprising: a flash lighting power source means, a flash tube for producing a quantity of light energy, a main capacitor connected to said power source for storing electric energy to be translated into light energy in said flash tube, a one-directionally conducting means arranged in the current supply path between the main capacitor and the flash tube, an auxiliary capacitor, one terminal of which is connected to the contact between the flash tube and the one-directionally conducting means, the other being connected to said power source means to store electric energy to be translated to light energy within the flash tube at an initial period of emission of said flash tube, a flash tube trigger circuit for applying a trigger voltage to the flash tube in order to initiate the flash discharge thereof, being associated with a trigger switch arranged in the charge-delivering path of said auxiliary capacitor.

3,912,969
DISCHARGE LAMP LIGHTING APPARATUS

Kenichi Nakai, Osaka, and Hiroshi Nishimura, Kyoto, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 11, 1974, Ser. No. 460,019
Claims priority, application Japan, Apr. 13, 1973, 48-42362; Apr. 13, 1973, 48-42364
Int. Cl.² H05B *41/16, 41/232*
U.S. Cl. 315—278 5 Claims



1. A discharge lamp lighting apparatus comprising a leakage transformer including a secondary winding, an auxiliary winding magnetically coupled with said secondary winding, and a current source winding common to said secondary and auxiliary windings, said auxiliary winding being wound on an iron core having a partly saturated characteristic, a discharge lamp connected in series with said secondary winding, the leakage transformer being wound so that the secondary winding produces a voltage which is lower than the starting voltage of the discharge lamp, and a phase advancing current circuit conductively coupling said auxiliary winding to said discharge lamp for increasing the lamp voltage to a level above said starting voltage to start the lamp.

3,912,970
ELECTRON BEAM DEFLECTION CORRECTION SYSTEM

James F. Chandler, Chicago; Wayne R. Chiodi, Northbrook; Raymond C. Figlewicz, Park Ridge, and Steven Karlovics, Darien, all of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed June 8, 1973, Ser. No. 368,142
Int. Cl.² H01J *29/56*
U.S. Cl. 315—370 7 Claims

1. In a color television receiver that includes:

a cathode ray tube having an image screen composed of luminescent dot triads distributed in a raster pattern with each triad having dots individually productive of respective red, green and blue colors;

means for producing a triad of three electron beams to excite respectively assigned ones of said dots, two of said beams being aligned in one direction while the other is displaced in the orthogonal direction;

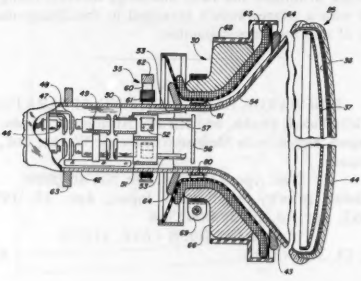
means for developing scanning fields to deflect said beams over said raster pattern to define an image, while intro-

ducing astigmatic distortion in said beam triad as said beams are deflected toward edges of said pattern; and

means tending to maintain convergence of said beams throughout action of said deflection means;

the improvement comprising:

means, distinct from said means for developing said scanning fields, for subjecting at least said other beam, in a location near the region of said scanning fields, essentially only to a pair of correcting fields within said scanning



fields at least near the deflection center of said developing means, said scanning fields, space-opposed on opposite sides of said other beam in said one direction and mutually aiding movement of said other beam in said orthogonal direction, to compensate said astigmatic distortion;

and means for energizing said subjecting means with energy which at least includes a component that varies parabolically in amplitude at the rate of change of said scanning fields in said one direction.

3,912,971

TELEVISION DISPLAY APPARATUS PROVIDED WITH A CIRCUIT ARRANGEMENT FOR GENERATING A SAWTOOTH DEFLECTION CURRENT

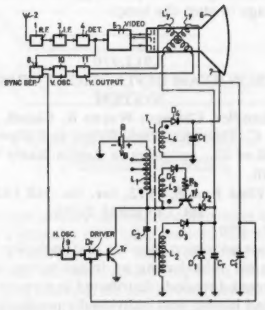
Henk Houkes, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,863

Claims priority, application Netherlands, Mar. 8, 1973, 7303252

Int. Cl.² H01J *29/70*

U.S. Cl. 315—408 **8 Claims**



1. Television display apparatus provided with a circuit arrangement for generating a sawtooth deflection current through a line deflection coil, said coil being a part of a network furthermore comprising at least a trace capacitor, a retrace capacitor and a first diode through which the deflection current flows during part of the trace time of the sawtooth current while said current flows through a second diode and a controllable switch during the other part of the trace time, a primary winding of a transformer being incorporated between a direct voltage source and the switch and its secondary winding being connected through a third diode to the network, characterized in that the circuit arrangement includes switching means for blocking any current in the second diode in the retrace time.

3,912,972

LINE DEFLECTION CIRCUIT FOR CATHODE-RAY TUBES

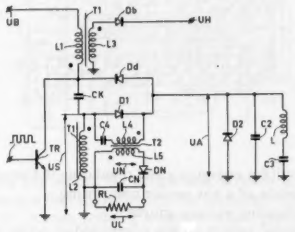
Walter Otten, and Günther Stacker, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,976

Claims priority, application Germany, Mar. 21, 1973, 2313961

Int. Cl.² H01J *29/70*

U.S. Cl. 315—411 **4 Claims**



1. A line deflection circuit for generating from a direct voltage source a sawtooth current flowing through a deflection coil, said circuit comprising a parallel resonant circuit comprising said coil, a trace capacitor coupled to said coil, and a retrace capacitor coupled to said coil; a first diode coupled to said retrace capacitor, the deflection current flowing during a first part of the trace period through said first diode and during a second part of the trace period through a controllable switch, energy being applied from said direct voltage source during the trace period to a first winding arranged between said direct voltage source and the switch, and being applied through a second diode conducting during the retrace period from a second winding to the parallel resonant circuit which is connected to the switch through a third diode conducting during the second part of the trace period, at least one of the second and third diodes being shunted by the series arrangement of a capacitor and a primary winding of a current supply transformer, and means for rectifying coupled to said transformer for the direct current supply to other stages of the device.

3,912,973

CONDUCTIVE HUMAN ELECTRICAL TERMINAL

David Arthur Young, 1130 Surrey, Glen Ellyn, Ill. 60137

Filed Jan. 14, 1974, Ser. No. 433,213

Int. Cl.² H05F *1/00, 3/02*

U.S. Cl. 317—2 B **4 Claims**

1. A conductive electrical terminal comprising a slip-on conductive boot or overshoe,

said boot or overshoe having a conductive sole, toe vamp, heel vamp and side vamp sections,

said toe vamp section comprising toe vamp cap,

said toe vamp cap having a horizontal portion covering the top front section of the user's shoe,

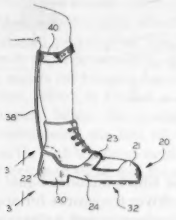
said heel vamp section comprising a member which comes up around the back and sides encircling the heel of a shoe, and the side vamp section rising above the sole and welt sections of the user's shoe, whereby said vamp sec-

tions come up over the user's shoe far enough to insure a good electrical contact between the boot or overshoe and ground regardless of the user's body position,

an integral conductive strap means extending from the heel area of the boot or overshoe upwardly,

a garter integrally and electrically connected to said strap for encircling the leg of the user below the knee and above the calf,

mechanical connector means on the garter to insure a snug, but not tight, comfortable fit around the user's leg without requiring tying,



one end of the garter includes a series of belt holes spaced from each other by distances which enable a user to select a comfortable length,

the mechanical connector on the garter is an upstanding post on the other end of the garter,

said post being formed in three sections,

one section being a somewhat rod-like member which fits through a hole and projects far enough on the other side of the garter for a worker to grip and pull it,

the next post section being conically shaped,

the last section being a post approximately the same diameter as a hole, and

said boot or overshoe strap and garter being free of snaps, buckles and loose parts.

3,912,974

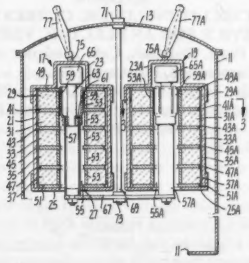
CIRCUIT BREAKER

George Leslie Hill, 49 Buckeye Ave., Oakland, Calif. 94618

Continuation of Ser. No. 12,179, Feb. 18, 1970. This application Jan. 14, 1974, Ser. No. 433,125

Int. Cl.² H02H 3/00; H01H 9/30, 33/00

U.S. Cl. 317—11 C **13 Claims**



1. In an electrical circuit breaker, the improvement comprising:

a plurality of resistors of generally washer shape disposed in aligned stacked relationship to define a throughbore extending therethrough, each of said resistors having a non-linear voltage-resistance characteristic;

electrically conductive washer-shaped contacts sandwiched between and in electrical contact with said resistors, said contacts being generally concentrically disposed relative to said resistors and having contact portions exposed inwardly of the throughbore; and,

an electrically conductive contactor movable with respect to said contacts in a path within the throughbore to selectively engage the contact portions of said contacts, said contactor comprising a portion of a high voltage electrical circuit and functioning to introduce the resistors into the circuit as it moves in one direction within the path and to remove the resistors from the circuit as it moves in the opposite direction within the path and wherein at the end of movement of said contactor in said one direction the contactor assumes a condition out of engagement with said contacts and resistors and deionization occurs to interrupt the high voltage circuit.

3,912,975

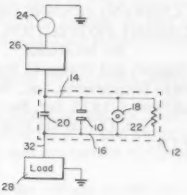
IMPEDANCE-INCREASING SYSTEM AND IN-LINE DEVICE THEREFOR

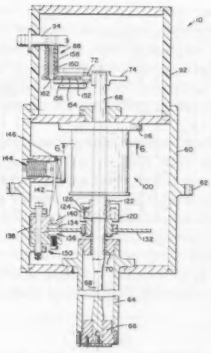
Wolfgang Knauer, Malibu, and William L. Dugan, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 15, 1974, Ser. No. 488,345

Int. Cl.² H02H 7/22; H01H 71/00

U.S. Cl. 317—11 C **28 Claims**





1. A switch comprising:

a housing;

shaft rotatably mounted on said housing;

a switch contact arm mounted on said shaft to swing from an open to a closed position upon rotation of said shaft; a fixed contact mounted on said housing to be contacted by said moving contact arm when said shaft is rotated to a contact closed position;

torque means connected to said shaft to torque said shaft in a rotational direction toward contact closed position and to maintain contact pressure of said moving contact on said fixed contact in contact closed position;

motor means connected to said shaft for rotating said shaft against the torque of said torque means to move said

moving contact away from said fixed contact to open said contacts; and

restraining means for restraining said shaft in a rotated position wherein said moving contact is out of contact with said fixed contact.

24. An impedance inserting circuit comprising:

a source of electric power, a series connection of said source, a circuit breaker, an in-line switch and a load, an electronic switch and a parallel resistor in parallel to said in-line switch so that upon opening of said in-line switch, current passes through said electronic switch and upon off-switching of said electronic switch said impedance is inserted into said circuit to limit current between said impedance and said powersource, said in-line switch comprising:

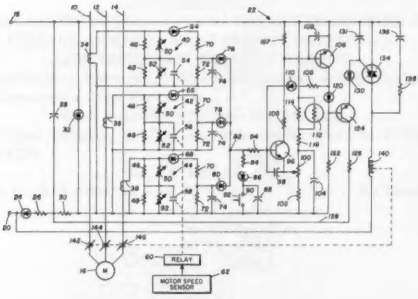
a frame, a shaft rotatably mounted in said frame, a movable contact arm mounted on said shaft and a stationary contact mounted on said frame, torque means for torquing said movable contact arm into contact with said stationary contact, motor means for rotating said shaft so that said movable contact arm is moved away from said contact and selective restraining means for selectively restraining said shaft against torque of said torque means for maintaining said contact arm away from said contact.

3,912,976

MULTILEVEL CURRENT SENSING DETECTOR SYSTEM FOR OVERCURRENT PROTECTION OF MULTISPEED AC MOTORS

James E. Sons, Sanger, and Wayne C. Starnes, Dallas, both of Tex., assignors to Detprotector, Inc., Dallas, Tex.

Filed Nov. 5, 1973, Ser. No. 412,809
Int. Cl.² H02H *3/08*
U.S. Cl. 317—13 R **20 Claims**



1. A system for protecting an alternating current phase multispeed motor for current above each of a plurality of predetermined current levels comprising:

means for sensing the current level on said phase,

circuitry connected in different configurations in response to different speeds of said motor for detecting the occurrence of a current level above each of said plurality of levels and for generating an electrical overload signal in response thereto, and

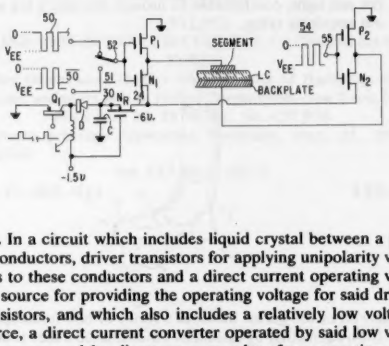
a semiconductor switch responsive to said overload signal for terminating current flow through said phase upon detection of current level above any one of said plurality of levels, the time interval between detecting of the occurrence of a current level above said predetermined levels and the termination of current flow being inversely proportional to the magnitude of the sensed current level.

3,912,977

DIRECT CURRENT PROTECTION CIRCUIT

Richard Plumb Fillmore, Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,783
Int. Cl.² H02H *3/24, 7/10*
U.S. Cl. 317—16 **6 Claims**



4. In a circuit which includes liquid crystal between a pair of conductors, driver transistors for applying unipolarity voltages to these conductors and a direct current operating voltage source for providing the operating voltage for said driver transistors, and which also includes a relatively low voltage source, a direct current converter operated by said low voltage source and by direct current pulses for converting said relatively low voltage to a relatively higher direct current voltage, said direct current converter serving as said direct current operating voltage source and said relatively higher voltage as said operating voltage for said driver transistors, said converter including an inductor direct current coupled between said relatively low voltage source and said driver transistors, and an energy storage means which is periodically charged by said inductor, the improvement comprising:

a switch having a conduction path, said path direct current coupled between said inductor and said driver transistors and operating to conduct the voltage produced by said converter to said driver transistors; and

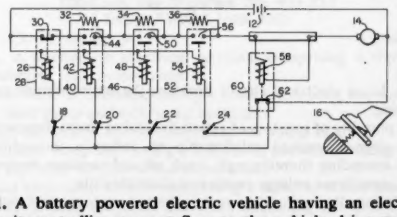
means responsive to the voltage difference between the voltage produced by said relatively low voltage source and that produced by the charge stored in said energy storage means for maintaining said switch closed when said voltage difference exceeds a given value and for opening said switch when said voltage difference drops to lower than said given value.

3,912,978

POWER CIRCUIT INCLUDING CURRENT LIMITING DEVICE FOR AN ELECTRIC VEHICLE

Charles W. Poole, Redlands, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 346,549, March 30, 1973. This application Jan. 6, 1975, Ser. No. 538,831
Int. Cl.² H02H *9/02*
U.S. Cl. 317—20 **9 Claims**



1. A battery powered electric vehicle having an electric circuit controlling current flow to the vehicle drive motor comprising:

a plurality of fixed resistors, connected in series, disposed between the battery and the vehicle drive motor;

a plurality of switches, switchable between an open position and a closed position, each of said plurality of switches being connected in parallel with at least one of said plurality of fixed resistors to short out the associated resistor when in the closed position;

a throttle, movable between a raised position and a depressed position, connected to said plurality of switches for sequentially switching said plurality of switches to the closed position as said throttle is depressed;

resistor reinsertion means for opening the last of said plurality of switches to close and electrically reinserting the last resistor to be shorted out when said throttle is depressed, shorting out all of said plurality of fixed resistors, and then current exceeds a predetermined value; and,

resistor maintaining means for keeping open the last of said plurality of switches, which is closed as said throttle is depressed with current below the predetermined level, and electrically maintaining the last of the plurality of fixed resistors in series with the drive motor when current exceeds the predetermined value and then said throttle is depressed.

3,912,979

PILOT WIRE PROTECTIVE RELAYING APPARATUS

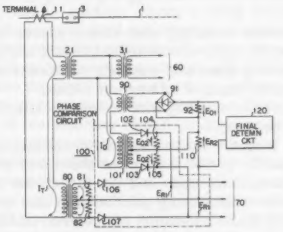
Ichiro Mikami; Hidesuke Sugai; Yosuke Tsujikura, and Toshinobu Ebisaka, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 26, 1974, Ser. No. 454,848

Claims priority, application Japan, Mar. 31, 1973, 48-37065

Int. Cl.² H02H *3/26*

U.S. Cl. 317—27 A **3 Claims**



1. A pilot wire protective relaying apparatus comprising, in combination, a protected line including a plurality of terminals, a first pilot wire for transmitting a current at each of said terminals of said protected line to the remaining terminals, first deriving circuit means at each terminal to transmit an operating voltage dependent upon a difference current between the total inflow current and the total outflow current at each of said terminals flowing through said first pilot wire, conversion means at each terminal to convert a current flowing through each of said terminals to a voltage, a second pilot wire for transmitting said voltage from said conversion means at each of said terminals to the remaining terminals, second deriving circuit means at each terminal to derive, as a restraining voltage, a voltage produced on said second pilot wire, a phase comparison circuit at each terminal to compare the phase of said restraining voltage with that of said operating voltage to control the magnitude of said restraining voltage in accordance with the result of the comparison, and a final determination circuit operative in response to the relationship between the magnitudes of said operating voltage and said restraining voltage provided by said comparison circuit.

3,912,980

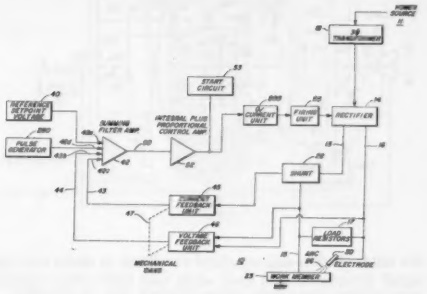
DIRECT CURRENT ARC POWER SUPPLY

Gwyn Norman Crump; Gary Allen Bogard, and Henry Byron Delius, all of Newark, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 20, 1974, Ser. No. 452,720

Int. Cl.² H02H *3/10*

U.S. Cl. 317—31 **15 Claims**



1. A direct current arc power supply for maintaining an arc between a pair of electrodes in which upon start of operation a startup direct current is applied to said electrodes for a sufficient time to allow said arc to become established, comprising

power means operable for providing direct current to said electrodes,

reference setpoint means to produce a set reference signal related to a desired value of said direct current,

means for sensing said arc current and providing a current feedback signal,

means for sensing the voltage across said electrodes and providing a voltage feedback signal,

feedback control means coupled to said power means for summing said set reference signal, said current feedback signal and said voltage feedback signal for applying a control signal to said power means to control the volt-ampere charateristic of said direct current,

start reference means for producing a start reference signal, and

start means for comparing said current feedback signal with said start reference signal, said start means including switch means for varying said control signal upon start up to produce a value of said direct current different from said desired value, said start means including time delay means for switching said direct current to said desired value upon a determined time delay interval after said current feedback signal increases to a predetermined value with respect to said start reference signal.

3,912,981

PROTECTIVE CIRCUIT FOR FIELD EFFECT TRANSISTOR AMPLIFIER

Katsuaki Tsurushima, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,782

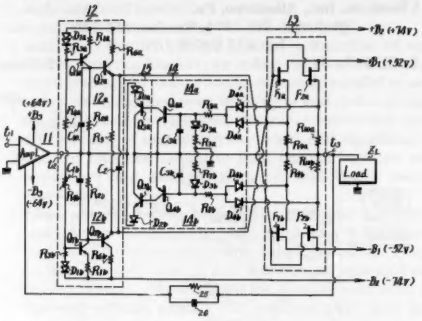
Claims priority, application Japan, Oct. 5, 1973, 48-111995

Int. Cl.² H02H *7/20, 9/04*

U.S. Cl. 317—33 R **29 Claims**

1. A transistor amplifier comprising: a voltage source for supplying an operating voltage; at least a first field effect transistor having gate, source and drain electrodes; means for applying said operating voltage across said drain and source electrodes through a load; input circuit means for applying an input signal to be amplified to said gate electrode of the field effect transistor; biasing circuit means for applying a predetermined gate bias voltage to said gate electrode; and protective circuit means for preventing overloading of said field effect

transistor including detecting means for detecting an overload condition of said field effect transistor, and shunting means controlled by said detecting means and being operative when



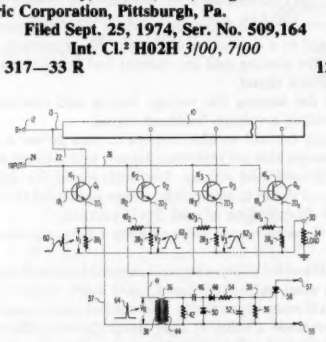
the latter detects said overload condition to shunt said input signal directly to said load while said field effect transistor continues to have said predetermined gate bias voltage applied thereto.

3,912,982

TRANSISTOR PROTECTIVE CIRCUIT WITH IMMINENT FAILURE SENSING

Robert H. Fasulkey, Fairfax, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,164
Int. Cl.² H02H 3/00, 7/00
U.S. Cl. 317—33 R **12 Claims**



1. A transistor protective circuit having means for sensing imminent transistor failure comprising in combination:

a plurality of transistors operated as a composite set of transistors;

a heat sink adapted for mounting said plurality of transistors thereon;

at least one transistor of said plurality thermally insulated, at least partially, from said heat sink, the remainder of said transistors being mounted directly on said heat sink; first circuit means for sensing the output current waveform of said at least one transistor;

second circuit means for sensing the output current waveform of a selected number of the remainder of said transistors;

third circuit means coupled to said first and second circuit means for comparing the respective current output waveforms of said selected number of transistors with the output current waveform of said at least one transistor and providing a difference current waveform therefrom; fourth circuit means coupled to said third circuit means, being responsive to said difference current waveform to produce an actuating signal in response to a predetermined amplitude of said difference current waveform indicative of imminent failure of said at least one transistor; and

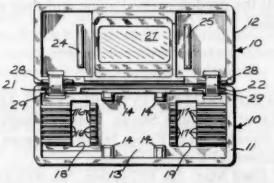
fifth circuit means responsive to said actuating signal and being rendered operative thereby to initiate predetermined protective action for said plurality of transistors.

3,912,983

HYBRID CIRCUIT HANDLING AND TESTING SYSTEM

Robert A. Lowry, Jr., Phoenix, Ariz., assignor to Micro-Rel, Inc., Tempe, Ariz.

Filed Sept. 4, 1973, Ser. No. 394,152
Int. Cl.² H05K 1/04
U.S. Cl. 317—101 CC **4 Claims**



1. A hybrid circuit handling and testing system which comprises:

base means including work-station means adapted to receive the body of said hybrid circuit and groove means extending from said work-station means adapted to receive the leads of said hybrid circuit;

cover means including window means closed by a transparent member;

means hingedly connecting said cover means to said base means for pivotal movement about said base means between positive open and positive closed positions, said window means being positioned in said cover means to overlie said work-station means when said cover means is in said positive closed position;

lead access means in said base means comprising aperture means interrupting at least some of said groove means;

boss means projecting from said cover means toward said lead access means when said cover means is in said positive closed position for contacting a lead within said groove means to hold it in place while restraining movement of said lead away from said lead access means;

socket means having a recess configured to accept a portion of said base means and said cover means when said cover means is in said positive closed position;

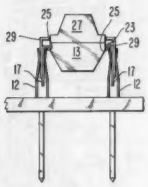
groove means within said socket means recess; and

spring biased means within said socket means recess and retractable into said socket means recess groove means, said spring biased means including a first portion lying at least partially within said groove means, a second portion angularly disposed relative to said first portion and forming contact means for extending through said lead access means to electrically contact a lead within said base means groove means and a third portion angularly disposed relative to said second portion and forming camming means for causing said spring biased means to retract into said socket means recess groove means when said contact means is not aligned with said lead access means aperture means.

3,912,984
AUXILIARY CIRCUIT PACKAGE

James A. Lockhart, Jr., Basking Ridge, N.J., and David Durney, Holland, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 431,063, Jan. 7, 1974, abandoned. This application Feb. 13, 1975, Ser. No. 549,524
Int. Cl.² H05K 1/18
U.S. Cl. 317—101 CC 6 Claims



1. An electrical circuit assembly comprising:

a primary circuit package having a body member with spaced side portions, said body member encapsulating a device with electrical circuitry thereon, a plurality of electrically conductive contact members extending from said body member side portions, said circuitry being electrically connected to said contact members;

a support member having a plurality of electrically conductive receptacles substantially corresponding in number to said contact members, said primary circuit package contact members being inserted into said receptacles;

an auxiliary circuit package having a body member with spaced side portions, said auxiliary circuit package body member encapsulating at least one circuit element, said circuit element having electrical characteristics desired to be added to the circuitry in said primary circuit package, a plurality of contact members extending from said side portions of the auxiliary circuit package body member and corresponding to the contact members of said primary circuit package, said circuit element being electrically connected to a selected number of said contact members of said auxiliary circuit package; and

said auxiliary circuit package contact members each being inserted into the same receptacles as their corresponding contact members of the primary circuit package with said circuit element being electrically connected with said circuitry in said primary circuit package.

3,912,985
HERMETIC DEVICE ENCLOSURE

Peter Sawchuk, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,493
Int. Cl.² H01G 9/00
U.S. Cl. 317—230 6 Claims

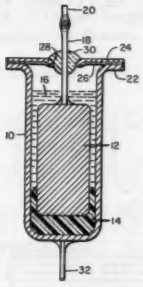
1. An enclosure comprising

a silver container with an uncoated interior surface and open at one end, said container having a unitary outwardly protruding flange at said open end,

a metallic cover substantially coextensive with said unitary outwardly protruding flange,

a layer of material selected from the group consisting of gold and gold alloy hermetically adhered to at least a surface of said metallic cover, said cover disposed so that said layer of material is adjacent said unitary outwardly protruding container flange, and

a hermetic seal between said unitary outwardly protruding container flange and the layer of material hermetically

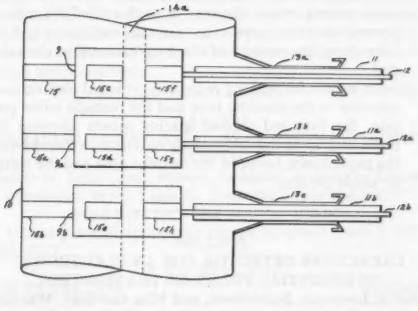


adhered to said metallic cover along said unitary outwardly protruding flange.

3,912,986
HIGH VOLTAGE CAPACITOR

Joseph N. Favata, and Edgar I. Biondi, both of Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1975, Ser. No. 541,536
Int. Cl.² H01G 4/28
U.S. Cl. 317—242 3 Claims

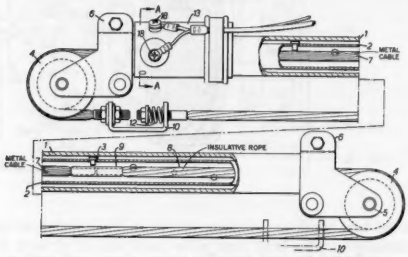


1. A high voltage capacitor being comprised of a single external cylindrical electrode having sealed ends also serving as a sealed container, a series of cylindrical inner electrodes longitudinally displaced along the axis within said external cylindrical electrode, first insulating means to support said series of cylindrical inner electrodes, second insulating means to space such series of cylindrical inner electrodes from said single external cylindrical electrode and also from said first insulating support means while simultaneously permitting vibration-free operation, a sealed channel through the wall of said external cylindrical electrode for each one of said series of cylindrical inner electrodes, an insulated conductor through each one of the sealed channels to make electrical connection to each one of said series of inner cylindrical electrodes, and a dielectric insulating fluid filling said single external cylindrical electrode.

3,912,987
VARIABLE CAPACITORS

Raymond W. Sargent, Shelburne, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,668
Int. Cl.² H01G 5/14
U.S. Cl. 317—249 R 10 Claims



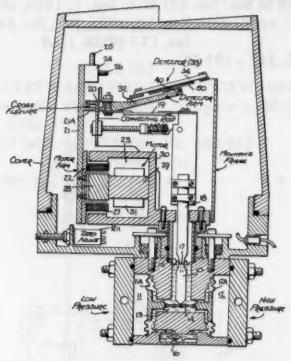
1. A variable capacitance transducer comprising:
a metallic tube,
a cable loop comprising:
a metallic cable portion, and
a cable portion of insulating material, the cable portions being joined to form a loop which passes in one direction coaxially through the metallic tube and returns external to the tube, to thereby interlink with the tube, insulative first spacing means disposed inside the tube and arranged to maintain the cable loop passing therethrough coaxial with the tube,
second spacing means disposed at each end of the tube to prevent electrical contact between the cable loop and the tube along the passage of the loop external to the tube, and
contact means for making respective external electric connections to the metallic tube and the metallic cable portion, the first and second spacing means allowing the cable loop to be displaced along its length to thereby vary the capacitance between the metallic tube and the metallic cable portion.

3,912,988
CAPACITIVE DETECTOR FOR AN ELECTRONIC DIFFERENTIAL PRESSURE TRANSMITTER

Peter S. Levesque, Jenkintown, and Max Gaertner, Warminster, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Division of Ser. No. 327,562, Jan. 29, 1973, Pat. No. 3,832,618. This application Feb. 11, 1974, Ser. No. 441,629
Int. Cl.² H01G 5/01
U.S. Cl. 317—249 R 1 Claim

1. A displacement-responsive capacitive detector comprising:
A. a dielectric plate constituted by borosilicate glass;
B. two spaced fixed flat electrodes mounted in a common plane on said plate;
C. terminals connected to said electrodes; and
D. an electrically-floating planar metal armature parallel to the faces of said electrodes, an air gap existing between said armature and said faces, said armature being movable in response to a displacement force relative to the faces of said electrodes to effectively vary the air gap therebetween, thereby changing the value of capacitance presented at said terminals as a function of displacement; said flat electrodes being metallized on one side of said plate and being constituted by a pair of semi-circular

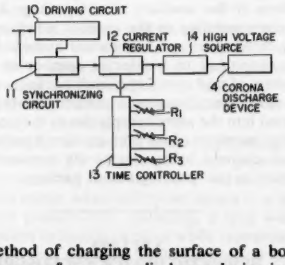


areas whose straight edges are separated by a straight air gap.

3,912,989
METHOD AND APPARATUS FOR CHARGING BY CORONA DISCHARGE

Masanori Watanabe; Takaaki Konuma, and Hirokazu Asano, all of Tokyo, Japan, assignors to Kabushiki Kaisha KIP, Tokyo, Japan

Filed Mar. 14, 1974, Ser. No. 451,008
Claims priority, application Japan, Mar. 30, 1973, 48-36293
Int. Cl.² H01T 19/00
U.S. Cl. 317—262 A 8 Claims



1. In a method of charging the surface of a body to be charged by means of a corona discharge device including a plurality of spaced corona discharge wires and substantially covering the entire surface of said body by relatively moving said body and said corona discharge device substantially parallel with each other, and wherein charging current tends to increase at a high rate through said body at the commencement of the corona discharge and tends to decrease at a high rate at the termination of the corona discharge, the improvement which comprises the steps of controlling the rate of increase of said charging current to a rate lower than said high rate of increase at the time of commencement of the corona discharge until a predetermined current value is reached, and controlling the rate of decrease of said current from said predetermined current value to a rate lower than said high rate of decrease at the time of termination of the corona discharge so as to prevent non-uniform charging of said surface caused by said corona discharge wires.

3,912,990
SPEED CONTROL ARRANGEMENT FOR A TWO REEL REWINDING APPARATUS

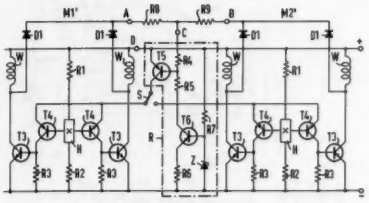
Hans Kuhnlein, Nurnberg-Grossgrundlach; Georg Kogler, Schwabach, and Rudolf Lanzendorfer, Rothenbach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 21, 1974, Ser. No. 444,655

Claims priority, application Germany, Feb. 28, 1973, 2310035

Int. Cl.² B65H *59/38*

U.S. Cl. 318—7 **4 Claims**



1. A speed control arrangement for rewinding apparatus having two reels with each reel driven by an associated speed controllable brush-less d-c motor having star connected stator windings comprising:

a. means to develop first and second signals proportional respectively to the speeds of the two motors including take-off diodes coupled to the stator windings of said motors, with each take-off diode associated with a motor coupled to a common junction point;

b. means to sum said first and second signals to develop a third signal including:

a first resistor having a wiper associated therewith which forms a tap thereon and having one side coupled to the common junction point of the diodes associated with one motor;

a second resistor having a wiper associated therewith which forms a tap thereon and having one end coupled to the common junction point of the diodes associated with the other motor;

said first and second resistors having their other ends coupled together to provide at said point of coupling said third signal;

and means for coupling the taps of said first and second resistors to the neutral point of the stator windings including isolation diodes and a series circuit comprising a voltage dependent resistor and an adjustable resistor, said series circuit being coupled to the taps on said first and second resistors through said isolation diodes;

c. means to generate a fourth signal representing a constant desired speed;

d. a speed control circuit having said third and fourth signals respectively as actual value and desired value inputs and responsive to said signals to provide an output proportional to the difference therebetween; and

e. means to selectively couple the output of said speed control circuit as the speed control input to one or the other of said two motors.

3,912,991
LINEAR-INDUCTION MOTOR WITH CONTINUOUS ACTIVE TRACK

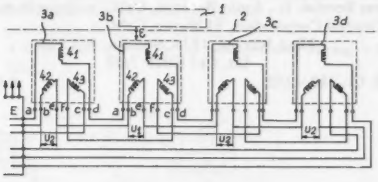
Gaston Moyse, La Courneuve (Seine Saint-Denis), France, assignor to Moyse S.A., La Courneuve (Seine Saint-Denis), France

Filed July 18, 1973, Ser. No. 380,197

Claims priority, application France, July 26, 1972, 72.26980

Int. Cl.² H02K *41/02*

U.S. Cl. 318—135 **8 Claims**



1. A linear induction motor system having a continuous active track and comprising at spaced intervals along the track at least two fixed stator members having polyphase coil windings, a source of polyphase alternate electric energy for energizing said windings, at least one armature on a vehicle movable along said track, the phase branches of the coils of all the successive stators being connected in series from one to the other end of the track the output of each stator coil of a given phase being connected to the input of the successive stator coil of the same phase from one to the other end of the track, at least one relay member associated with each stator and actuated when said at least one armature moves past a respective stator, by an increased voltage induced in the coils of said stator when the stator becomes operative, for automatically actuating switch means of a detector circuit, switch members being associated with said stator coils for short-circuiting all coils of a desired stator and thus varying the resistance of each stator coil circuit of the entire track for modifying the motor speed when necessary.

3,912,992
PARALLEL CONNECTED LINEAR ELECTRIC MOTOR SYSTEM

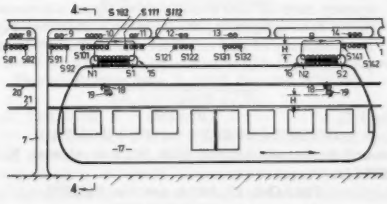
Cedric St. John Lamb, Sydney, Australia, assignor to Kenneth Barrington Wyld, Lugarno, Australia, a part interest

Filed May 28, 1974, Ser. No. 473,804

Claims priority, application United Kingdom, June 1, 1973, 26165/73

Int. Cl.² H02K *41/02*

U.S. Cl. 318—135 **40 Claims**



1. A parallel connected linear electric motor system comprising an armature having at least one coil group including at least one conductor, said coil group being individually connectable in parallel across a power supply through corresponding means for supplying a unidirectional flow of current through said coil group for a predetermined period of time,

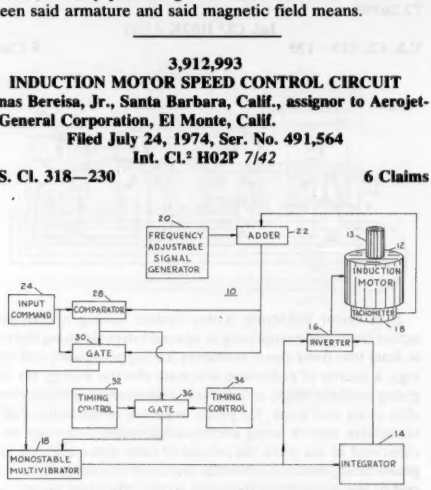
means for independently selecting the direction of flow of said unidirectional current in said coil group, and magnetic field means having at least one field member and a corresponding associated unidirectional magnetic field, said magnetic field means and said armature being operatively associated with a linear track and being arranged to provide a mutual force between said coil group and said magnetic field on flow of said current, thereby producing relative translational motion between said armature and said magnetic field means.

3,912,993

INDUCTION MOTOR SPEED CONTROL CIRCUIT

Jonas Bereisa, Jr., Santa Barbara, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed July 24, 1974, Ser. No. 491,564
Int. Cl.² H02P 7/42
U.S. Cl. 318—230 **6 Claims**



1. An induction motor speed control circuit capable of rapidly increasing the operating speed of an induction motor, said control circuit comprising:

drive signal means for providing a cyclic electric signal for driving an induction motor, the frequency of said motor driving signal at least partially determining the operating speed of the motor;

command signal means for providing a cyclic command signal having a frequency representing desired motor speed;

reference signal means for providing a cyclic reference signal having a frequency representing a speed slightly greater than the operating speed of the induction motor;

frequency control means for providing said motor driving signal with a frequency equal to the frequency of the one of said command and reference signals having the lower frequency, the frequency of said motor driving signal increasing at a rate controlled in accordance with actual increasing speed to provide rapid motor acceleration when equal to the frequency of said reference signal; and

voltage control means for increasing the voltage-to-frequency ratio of said electric drive signal whenever said motor driving signal is provided with a frequency equal to the frequency of said reference signal, thereby to further provide rapid motor acceleration.

3,912,994

DIRECT CURRENT MOTOR CONTROL

Leonard A. Stovall, 2481 B 36th St., Los Alamos, N. Mex. 87544

Filed Oct. 17, 1974, Ser. No. 515,502
Int. Cl.² H02P 5/16
U.S. Cl. 318—341 **5 Claims**

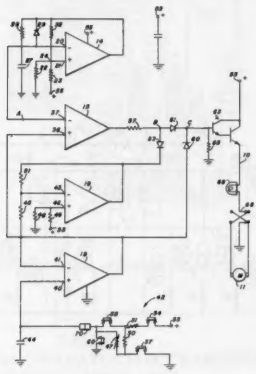
1. A circuit for running a d-c motor from a control voltage, which produces pulses at low control voltages of width proportional to the control voltage and of magnitude inversely proportional to the control voltage, and which produces the control voltage at higher control voltage levels, comprising:

means for generating a periodic ramp voltage waveform,

means for generating a d-c control voltage,

means connected to said d-c control voltage generating means for selectively varying the control voltage thereof, level comparator means to which the ramp waveform and the control voltage are applied for producing a pulse output at times when the control voltage is greater than the voltage of the ramp waveform,

inverter means to which the control voltage is applied for producing an output inversely proportional to the control voltage,



first mixing means to which the output of said inverter means and the output of said level comparator means are applied for establishing a voltage limit upon the pulses generated by said level comparator at the level of the output voltage of said d-c inverter,

second mixing means to which the output from said first mixing means and the control voltage are applied, for passing the higher voltage of said output from said first mixing means and said control voltage, and

a current amplifier to which the output from said second voltage mixing means is applied for amplifying said output and applying it to the motor.

3,912,995

CURVE MILLING OR CURVE GRINDING MACHINES INCLUDING FEED RATE CONTROL

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Dec. 6, 1973, Ser. No. 422,483
Claims priority, application United Kingdom, Dec. 21, 1972, 59036/72
Int. Cl.² G05B 19/24
U.S. Cl. 318—571 **9 Claims**

1. A shaping machine comprising, in combination:

a frame;

tool support means displaceably mounted on said frame;

workpiece support means rotatably mounted on said frame;

first displacement means to rotatably displace said workpiece support means;

second displacement means to displace said tool support means relative to said workpiece support means;

a repetitious signal generator coupled to said first displacement means to generate a predetermined number of repetitious signals on each predetermined angular displacement of said workpiece support means;

divider means to output a signal on the generation of each of a predeterminable number of said repetitious signals, said divider means comprising a plurality of divider devices each having respective input means and respective

output means, each said divider device providing a plurality of said output signals at said respective output means corresponding to the number of said repetitious signals applied to said respective input means divided by a respective divider ratio;

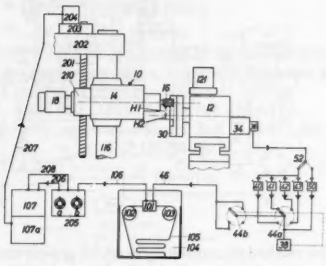
selectably operable setting means to set each said divider device to said divider ratio and thereby to determine the numerical value of said predeterminable number;

first storage means to store said output signals derived from said divider means;

means to derive control signals from said first storage means in dependence on the state thereof;

first connector means responsive to said control signals to connect the respective output means of each said divider device successively to said first storage means;

further storage means to store a series of signals each coded to represent a respective predetermined displacement of said tool support means;



extractor means;

second connector means responsive to said control signals to successively connect the respective output means of selected ones of said divider devices to said extractor means, said extractor means being responsive to successive ones of said signals output from said divider means and applied to said extractor means to serially extract respective ones of said stored signals from said further storage means;

computer means connected to said extractor means to receive said signals extracted thereby and to provide further signals each coded to represent a displacement value in predetermined proportionality to the displacement represented by a respective one of said extracted signals; and

translator means connected to said computer means to receive said further signals therefrom, to translate said further signals into command signals and to apply said command signals to said second displacement means.

3,912,996

SEEKING SWITCH POSITION CONTROL DEVICE FOR A MOVABLE MEMBER

Nobuyuki Yanagawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1973, Ser. No. 352,687

Claims priority, application Japan, Apr. 20, 1972, 47-40102

Int. Cl.² G05B *11/14*

U.S. Cl. 318—673 **1 Claim**

1. A position control device including

a. a first shaft;

b. a movable body carried by and slidable along the length of said first shaft, said first shaft defining a plurality of positions to which the movable body is moved slidably;

c. a second, rotatable shaft;

d. means interconnecting said movable body and said rotatable shaft such that said movable body is capable of moving to a selected one of said plurality of positions on said first shaft;

e. a motor for rotatably driving said rotatable shaft;

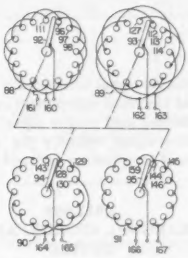
f. a detector for detecting a current position of the movable body and for producing a digital signal indicative of the position of the movable body;

g. a selector, manually operated in accordance with a desired position of the movable body, for producing a digital signal indicative of the desired position; and

h. circuit means for comparing the digital signals from the selector and the detector to provide a comparison output, said circuit means including a solenoid energized in accordance with the comparison output and a switch controlled by said solenoid, said circuit means being operable to control the operation of the motor through said switch; wherein the improvement comprises:

i. a positioning device comprising

i. a first lever driven by the solenoid and having a free end;



ii. a roller pivotally mounted at the free end of the first lever;

iii. a cam connected with the rotatable shaft and contacting the roller when the first lever is driven to a contacting position by the solenoid when the motor is turned off by the solenoid, the cam having a recess into which the roller drops and is locked to position the cam when the recess is positioned in rotational alignment with the roller;

iv. a second lever journalled in the cam and adapted to be driven by the roller when the roller drops into the cam recess; and

v. a gear, coupled with the drive shaft of the motor, engaged in rotational alignment with the cam by the second lever to permit shaft rotation when the second lever is not driven by the roller, and disengaged from the cam to stop shaft rotation when the second lever is driven by the roller.

3,912,997

BIAS AND SCALE FACTOR TEMPERATURE COMPENSATION NETWORKS, FOR USE IN A FORCE REBALANCE SYSTEM

Romeal F. Asmar, Concord, Calif., assignor to Systron Donner Corporation, Concord, Calif.

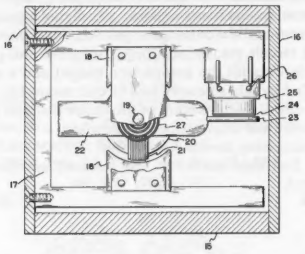
Continuation of Ser. No. 307,109, Nov. 16, 1972, abandoned. This application June 3, 1974, Ser. No. 476,063

Int. Cl.² G05B *11/01*

U.S. Cl. 318—676 **21 Claims**

1. In a transducer, a mechanical structure having means forming a magnetic field, said mechanical structure having mechanical parts in which temperature dependent dimensional changes cause flexing therein, a movable restoring coil disposed in the magnetic field, a paddle carried by the restoring coil, a pickoff disposed on the mechanical structure adjacent to the paddle, means supplying a signal to the pickoff, a detector connected to the pickoff and providing an output signal, said output signal being coupled to said restoring coil and having therein an electrical component which is related to the temperature induced flexing in said mechanical parts,

circuit means located adjacent said mechanical structure having at least one circuit component subject to predetermined change in resistance value related to temperature change, means for energizing said circuit means connected thereto so that said one circuit component provides an electri-



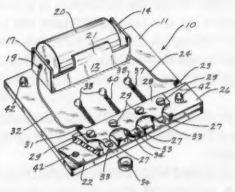
cal bias compensation signal substantially equal and opposite in polarity to said electrical component in said output signal, and means combining said output signal and said electrical bias compensation signal whereby the combined signal is substantially free of temperature induced bias change.

3,912,998

BATTERY CHARGING, STORING AND DISPENSING DEVICE

Vernon C. Harris, Rte. 1, Heyworth, Ill. 61745

Filed Sept. 16, 1974, Ser. No. 506,413
Int. Cl.[2] H02J *7/00;* **B65D** *73/02*
U.S. Cl. 320—2 **8 Claims**



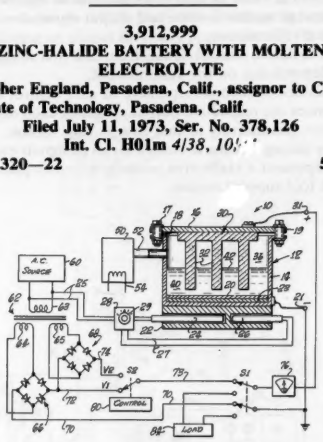
1. A battery charging and storing apparatus comprising:
a housing of a non-conductive material;
a source of electrical power connected to said housing;
a first sheet of conductive material disposed on said housing;
a layer of non-conductive material disposed on said first sheet of conductive material;
a second sheet of conductive material disposed on said layer of non-conductive material whereby the layer of non-conductive material is disposed between the first and second sheets of conductive material;
a slot formed in one edge of said layer of non-conductive material, the bottom thereof defined by a portion of said first sheet of conductive material and the top thereof being defined by a portion of said second sheet of conductive material, said portion of said second sheet of conductive material being of a leaf spring configuration;
means for holding a battery in said slot in contact with said portions of said first and second sheets of conductive material;
said source of electrical power being electrically connected to said first and second conductive sheets; and
means for removing a battery from said slot, comprising:
an opening in said non-conductive layer terminating at one end into the slot and terminating at the other end on an outside edge of said non-conductive layer;
a plunger received in a sliding relationship in said opening and having means on each end thereof for preventing the plunger to pass out of said opening, said plunger having a first position substantially outside of said slot and a second position extending substantially into said slot; and
means for biasing said plunger to said first position.

3,912,999

ZINC-HALIDE BATTERY WITH MOLTEN ELECTROLYTE

Christopher England, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 11, 1973, Ser. No. 378,126
Int. Cl. H01m *4/38, 10/*
U.S. Cl. 320—22 **5 Claims**



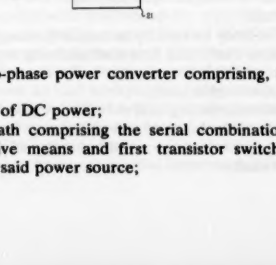
1. The method of controlling dendrite growth during charging of a secondary electrical cell which includes a solid zinc anode and a molten electrolyte consisting essentially of zinc halide which is electrolyzed during charging of the cell to metallic zinc and halogen, said method comprising
maintaining the electrolyte at a charging temperature which is higher than the melting temperature of the electrolyte and is only slightly less than the melting temperature of zinc,
and charging the cell at a normal charging current of such magnitude that dendrites growing from the anode into the electrolyte are melted by heat generated locally by the charging current.

3,913,000

TWO-PHASE SOLID STATE POWER CONVERTER

Gilbert I. Cardwell, Jr., Palos Verdes Peninsula, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 29, 1973, Ser. No. 365,295
Int. Cl.[2] H02M *3/22*
U.S. Cl. 321—2 **11 Claims**



1. A two-phase power converter comprising, in combination:
a source of DC power;
a first path comprising the serial combination of a first inductive means and first transistor switch connected across said power source;

a second path comprising the serial combination of a second inductive means and a second transistor switch connected across said power source;

pulse driving means for driving said transistor switches in phase opposition with first and second trains of regularly recurring drive pulses;

output means connected to said first and second inductive means;

comparison means for comparing the average currents in said first and second paths and for producing a voltage proportional to a current imbalance in said paths;

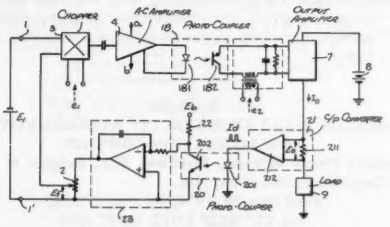
pulse modulator means associated with said pulse driving means and coupled to said comparison means for adjusting the relative lengths of the drive pulse of said first and second trains, the relative lengths of said adjusted drive pulses being proportional to said voltage; and

means for applying the train of pulses having the shorter relative pulse lengths to the transistor of the path having the greater average current.

3,913,001
CHOPPER-TYPE D-C AMPLIFYING SYSTEM

Nagaoki Kayama, Tokyo, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 420,937
Claims priority, application Japan, Jan. 31, 1973, 48-13221
Int. Cl.² H02M *3/28*
U.S. Cl. 321—2 **1 Claim**



1. A chopper-type D-C amplifying system having input-output isolation, said system comprising,

A. means including a chopper to convert an error signal derived from the combination of said input D-C signal and a feedback signal to an alternating signal,

B. a photo-coupler having a light-emitting element responsive to said alternating signal to produce a corresponding light signal and a light-sensitive element intercepting said light signal to produce an electrical signal, said lightsensitive element being constituted by a photo-transistor,

C. a synchronous rectifier including said light sensitive element to demodulate said electrical signal to produce a D-C voltage signal;

D. an output amplifier coupled to said rectifier and responsive to said D-C voltage signal to produce a current output signal,

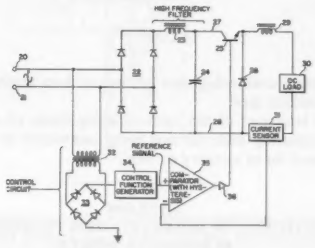
E. a feedback circuit responsive to said current output signal and including isolation means to produce said feedback signal, said feedback circuit including a current-to-pulse duty cycle converter responsive to said current output signal, a photo-coupler having a light-emitting element responsive to the output of said converter to produce a corresponding light signal and a light-sensitive element intercepting said light signal to produce a corresponding electrical signal, and a duty cycle-to-voltage converter responsive to said electrical signal to produce the feedback signal applied to said chopper, and

F. an oscillator producing an alternating voltage which is applied to said chopper to actuate same at a periodic rate, which alternating voltage is also applied to said synchronous rectifier to concurrently actuate same, said photo-transistor rectifying said alternating voltage.

3,913,002
POWER CIRCUITS FOR OBTAINING A HIGH POWER FACTOR ELECTRONICALLY

Robert L. Steigerwald, Scotia, and John N. Park, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,914
Int. Cl.² H02M *3/335, 5/257, 7/155*
U.S. Cl. 321—2 **6 Claims**



1. A circuit for obtaining a high power factor electronically comprising

a single phase solid state chopper circuit for energization by low frequency alternating-current sinusoidal line voltage and electronically shaped line current and comprising high frequency filter means for supplying sinusoidal voltage to a pair of supply terminals, and further comprising controlled switching means and coasting device means effectively coupled to said supply terminals and to coasting inductor means and operated to be conductive alternately to supply load current through said coasting inductor means to a load,

current sensor means coupled to sense the instantaneous load current and produce a sensor signal indicative thereof, and

a control circuit including generating means for generating a reference signal in phase with the line voltage and having a preselected waveshape and magnitude to determine the power level and to effect shaping of the line current by means of shaping the load current to obtain a high line power factor exceeding 90 percent, comparing means for instantaneously comparing said sensor and reference signals and producing an output signal, and circuit means actuated by said output signal for operating said controlled switching means at a variable high frequency chopping rate to force and shape the line current as the result of forcing and shaping the load current as determined by the preselected reference signal waveshape.

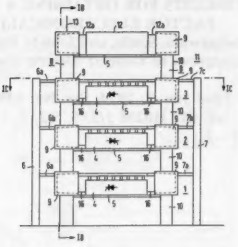
3,913,003
COMPACT CONVERTER BUILDING BLOCK SYSTEM

Heinrich Felkel, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 3, 1974, Ser. No. 511,630
Claims priority, application Germany, Oct. 31, 1973, 2354663
Int. Cl.² H02M *7/00;* **H01L** *1/16*
U.S. Cl. 321—8 R **9 Claims**

1. In a converter having series connected thyristors assembled, together with circuit components, in a framework containing a plurality of support columns, wherein the improvement comprises support columns having:

a. at least one carrier in the form of a cup with a plurality of flat side surfaces and a bottom in each column;
b. vertical support elements of an electrical insulating material making up a portion of each column;



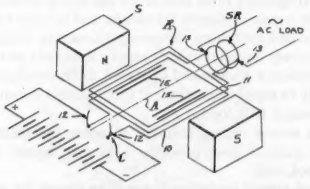
c. screws connecting said carriers to said vertical support elements; and
d. at least one of the carriers being made of electrically conducting material and being connected in the series circuit so as to carry current.

3,913,004

METHOD AND APPARATUS FOR INCREASING ELECTRICAL POWER

Robert W. Alexander, Pasadena, Calif., assignor to Alex, Pasadena, Calif.

Filed Nov. 18, 1974, Ser. No. 524,556
Int. Cl.² H02M *7/64*
U.S. Cl. 321—28 **27 Claims**



1. A dynamo-electric converter for inverting direct current voltage to alternating current voltage and including; a magnetic field having poles of opposite polarity, an armature coaxial with the field and having a core with means to receive windings, coaxial bearing means between the field and the armature, a primary motor-transformer winding in said means of the armature core and a commutator connected therewith, direct current input brushes engageable with the said commutator, a secondary transformer-generator winding in said means of the armature core and slip rings connected therewith, and alternating current output brushes engageable with the said slip rings, whereby direct current input power is both transformed and regenerated as alternating output power.

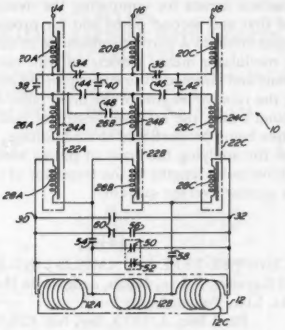
3,913,005

FREQUENCY MULTIPLIER CIRCUIT FOR CONTROLLING HARMONIC CURRENTS

Thomas H. Cook, Cherry Hill, N.J., assignor to Inductotherm Corporation, Rancocas, N.J.

Filed Aug. 28, 1974, Ser. No. 501,398
Int. Cl.² H05B *5/04*; H02M *5/16*
U.S. Cl. 321—68 **6 Claims**

1. A multiplier circuit for controlling the harmonic currents present in the secondary coils of a plurality of saturable core transformers, comprising:
a plurality of transformers having saturable cores, each of said transformers being adapted to be coupled to a different phase of a multiphase power source and including a primary winding, a secondary winding and a tertiary winding;
said secondary windings being electrically connected in series;
means for alternately connecting said tertiary and primary windings in a first and a second circuit configuration,



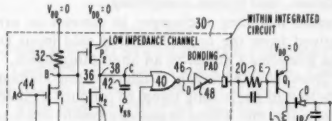
said first circuit configuration being such that said saturable cores are in saturation whereby significant harmonic currents are produced in said secondary windings,
said second configuration being such that said saturable cores are driven out of saturation whereby negligible harmonic currents are produced in said secondary windings.

3,913,006

VOLTAGE REGULATOR CIRCUIT WITH RELATIVELY LOW POWER CONSUMPTION

Richard Plumb Fillmore, Plainfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,553
Int. Cl.² H02P *13/18*; G04C *3/00*
U.S. Cl. 323—17 **11 Claims**



1. In combination:
a charge supply circuit;
means responsive to a control signal which recurs at a fixed frequency for supplying energy to said charge supply circuit during spaced time intervals which recur at said fixed frequency, said control signal having a time duration which is only a small fraction of the recurrence period of said control signal;
a charge storage circuit for producing an output voltage proportional to the charge stored therein connected to said charge supply circuit for receiving charge therefrom upon the termination of each said spaced time interval;
means coupled to said charge storage circuit and responsive to said control signal for sampling said output voltage across said charge storage circuit only for an interval during each recurrence period of said control signal which is not greater than the duration of said control signal; and

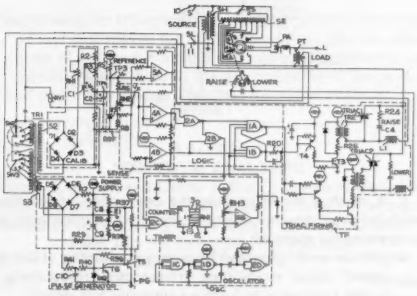
means responsive to the sampled voltage for adjusting the duration of each said spaced time interval to a value not substantially greater than that required to permit the replacement of the charge lost by said charge storage circuit since the preceding sampling period.

3,913,007

STATIC CONTROL FOR STEP VOLTAGE REGULATOR

Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 1, 1974, Ser. No. 520,036
Int. Cl.² G05F *1/20*
U.S. Cl. 323—43.5 S **15 Claims**



1. In a control for a step voltage regulator adapted to raise and lower the regulator output voltage when raise and lower windings of a tap changer reversible electric motor are respectively energized, in combination,

sensing means for deriving a sample voltage which is a function of the regulator output voltage,

a predetermined reference voltage source,

means for deriving upper and lower limit reference potentials which are respectively more positive and more negative than the reference voltage by a preselected fraction of said reference voltage and including bandwidth setting means for adjusting said preselected fraction,

first and second comparator means for comparing said sample voltage respectively to said upper limit reference potential and to said lower limit reference potential,

a timer adapted to provide an output a preselected time interval after it is started,

first and second triggerable semiconductor switching means for respectively energizing said raise and lower motor windings,

means for starting said timer in response to operation of said first comparator means or to operation of said comparator means, and

first firing means for triggering said first semiconductor switching means in response to the simultaneous occurrence outputs from said timer and from said second comparator means, and

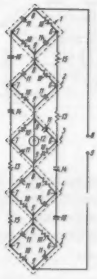
second firing means for triggering said second semiconductor switching means in response to the simultaneous occurrence of outputs from said timer and from said first comparator means.

3,913,008

IMPEDANCE RC-TRANSFORMER

Gennady Pavlovich Gaev, Matveevskaya ulitsa, 1, kv. 405; Evgeny Fedorovich Zimin, Yaroslavskoe shosse, 12, kv. 121, and Valentin Pavlovich Gaev, Matveevskaya ulitsa, 1, kv. 405, all of Moscow, U.S.S.R.

Filed Jan. 16, 1974, Ser. No. 433,886
Int. Cl.² H03F *1/08*
U.S. Cl. 323—75 A **4 Claims**



1. An impedance RC-transformer comprising, in combination: several bridges; each bridge having therein four arms, different adjacent pairs thereof defining an energizing diagonal and a measuring diagonal, each with a pair of vertices that together constitute the respective bridges; opposite pairs of arms in said bridges including identical components; said bridges being successively interconnected in series by the vertices of their energizing diagonals, an initial bridge being disposed at the center of the series, followed in both directions by at least one intermediate bridge, and thereafter by a terminal bridge; a voltage source connected across said energizing-diagonal vertices of the initial bridge; and output terminals connected to the respective outermost ones of said energizing-diagonal vertices of the terminal bridges; the arms of said intermediate bridges including components identical with those of respective adjoining arms of said initial bridge, while the arms of said terminal bridges include components different from those of respective adjoining arms of said intermediate bridges; the measuring-diagonal vertices of said intermediate bridges being each connected to respective measuring-diagonal vertices of said initial bridge via components different from those of the respective ones of said adjoining arms of both the intermediate bridges and the initial bridge, while said measuring-diagonal vertices of the terminal bridges are each coupled to respective measuring-diagonal vertices via components identical with those that couple said measuring-diagonal vertices between said intermediate bridges and said initial bridge.

3,913,009

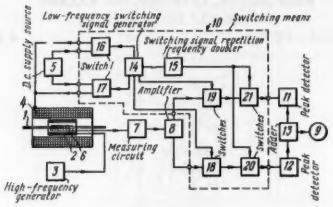
METHOD OF INSPECTING POWDER-CORED ELECTRODES AND DEVICE FOR EFFECTING SAID METHOD

Vladimir Vasilievich Panasjuk, ulitsa Martovicha, 9, kv. 7; Genrikh Nikolaevich Makarov, ulitsa Stavovaya, 24, kv. 2; Anatoly Yakovlevich Teterko, ulitsa Mayakovskogo, 25, kv. 1, and Ivan Vasilievich Kartovsky, ploschad Rozy, Ljuxemburg 6, kv. 4, all of Lvov, U.S.S.R.

Filed Mar. 12, 1974, Ser. No. 450,498
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 R **6 Claims**

1. A method of inspecting powder-cored electrodes, which are constituted by two components, namely casings filled with powder charges, comprising the steps of: introducing an electrode being inspected simultaneously into, and subjecting the same to, the combined effect of a high-frequency field and a magnetostatic field; changing the magnitude of the latter at

least twice during the inspection; recording variations in the magnetic induction of the high-frequency field at the different magnitudes of the magnetostatic field, which variations are brought about by the introduction of the electrode in the field; then comparing the variations of the obtained records, one of the variations having been changed prior to introduction of the electrodes into the magnetizing fields to, thereby offset the influence of one of the two electrode components; and determining the weight of the other electrode component by the difference in the variations.



3,913,010

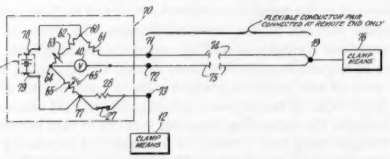
MEANS AND METHOD FOR MEASURING ELECTRICAL-GROUND RESISTANCE BETWEEN EARTH-SEPARATED LOCATIONS

Leopoldo Scarpino, Evansville, Ind., assignor to AMAX Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,243, July 16, 1973, which is a continuation-in-part of Ser. No. 358,468, May 9, 1973. This application Apr. 30, 1974, Ser. No. 465,591

Int. Cl.² G01R *31/02, 27/20*

U.S. Cl. 324—51 **10 Claims**



1. As an article of manufacture, a unitary ground-resistance measuring set adapted for use with a local earth-ground connection at one end of an elongate electrical multiple-conductor cable the other end of which includes at least two conductor connections to a remote ground to earth; said set comprising resistance-bridge elements consisting of elements of two conjugate arms for connection between opposed first diagonal bridge terminals, one of which terminals is said remote ground and the other of which is contained in said set; a monitoring variable resistor connected at one end to the first diagonal bridge terminal of said set and having means at its other end for connection to said local earth-ground connection, whereby said monitoring resistor may be connected in series with the earth between cable ends to define one of the conjugate arms, and whereby the local earth-ground connection may be one terminal of the second diagonal of the bridge; two series-interconnected resistance members forming elements of the other conjugate arm and connected at one end to the first diagonal bridge terminal of said set and having means at its other end for connection to one of the remote-grounding conductors of said cable, the point of interconnection of said resistance members of said other conjugate arm defining the other terminal of the second diagonal of the bridge; d-c source supporting means at said set and having first and second pole connections to the terminals of one bridge diagonal; and voltage-responsive means at said set and interconnecting the terminals of the second bridge diagonal; the diagonal connection to said remote-ground terminal being via the other remote-grounding conductor of said cable.

3,913,011

METHOD AND APPARATUS FOR MEASURING CONVERSION OF AMPLITUDE MODULATION TO PHASE MODULATION

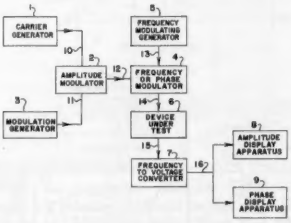
Leon Hughes, San Mateo, Calif., and Michael Crabtree, Linlithgow, Great Britain, assignors to Hewlett-Packard Limited, South Queensferry, Scotland

Filed Mar. 29, 1974, Ser. No. 456,095

Claims priority, application United Kingdom, Apr. 4, 1975, 16060/73

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 R **11 Claims**



1. A method for measuring the conversion of amplitude modulation to phase modulation caused by a device under test comprising the steps of:

amplitude modulating and frequency modulating at first and second input modulating frequencies, respectively, a carrier frequency to form a composite test signal;

applying the composite test signal as an input to the device under test;

applying an output of the device under test to a frequency to voltage converter to produce a composite converter output signal having basically two components, a first component having a frequency corresponding to the first input modulating frequency and a second component corresponding to the second input modulating frequency; and

measuring variation of the composite converter output signal with respect to the composite test signal as a value indicative of amplitude modulation to phase modulation conversion caused by the device under test.

3,913,012

MICROWAVE MOISTURE MEASURING SYSTEM WITH REFLECTION SUPPRESSING MEANS

Klaus Kujath, Erlangen, Germany, assignor to Frieseke & Hoepfner GmbH, Erlangen, Germany

Filed Feb. 22, 1974, Ser. No. 444,715

Claims priority, application Germany, Feb. 24, 1973, 2309278

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 A **5 Claims**

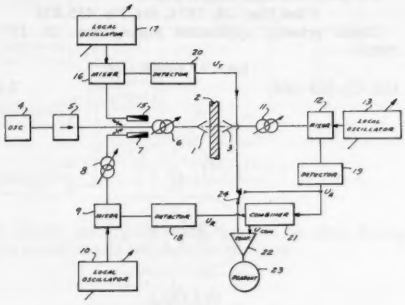
1. A method of measuring the microwave absorptivity of a flat workpiece comprising the steps of:

transmitting a beam of microwave radiation from a sending antenna on one side of said workpiece at a right angle through said workpiece to a receiving antenna on the other side thereof;

receiving said beam at said receiving antenna and generating an output corresponding to the intensity of microwave radiation received;

detecting through said sending antenna microwave radiation reflected by said workpiece back from said beam and

generating an output corresponding to the intensity of reflected microwave radiation detected;



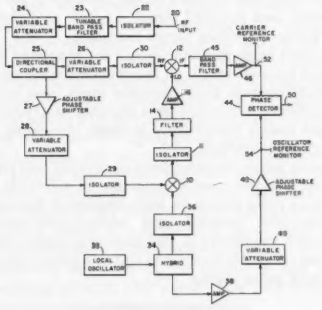
suppressing the reflection of microwave radiation from each of said antennas to the other antenna and internal reflections of microwave radiation in said sending antenna; and combining said outputs for determination of the portion of microwave energy absorbed by said workpiece.

3,913,013

SPECTRUM ANALYZER

Thomas A. Barley, and Gustaf J. Rast, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1974, Ser. No. 493,003
Int. Cl.² G01R 23/16
U.S. Cl. 324—77 B **8 Claims**



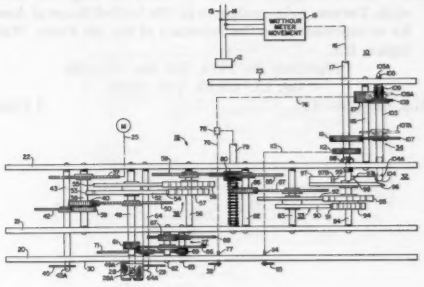
1. Apparatus for measuring frequency modulated spectral energy comprising: first and second frequency mixers, an output of said first mixer being coupled as a first input of said second mixer; a stable local oscillator having an output coupled as a first input of said first mixer, a radio frequency input for receiving radio frequency input signals, a directional coupler having an input and first and second outputs, a tunable bandpass filter coupled between said radio frequency input and said directional coupler input for selectably tuning a desired radio frequency input signal from an octave band of frequencies to be analyzed, said directional coupler outputs being coupled to respective second inputs of said first and second mixers for selectably mixing the radio frequency input signal with an output signal of said oscillator and thereby obtaining the oscillator frequency with RF spectral sidebands as an output of said second mixer.

3,913,014

DEMAND METER FOR ON-PEAK MAXIMUM DEMAND METERING

Kenneth G. Halstead, and Eugene C. Benbow, both of Raleigh, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1974, Ser. No. 479,071
Int. Cl.² G01R 19/16, 15/08
U.S. Cl. 324—103 R **14 Claims**



1. A demand meter for periodically measuring maximum watt demand during a desired on-peak demand measuring period, comprising:

a watt-hour metering means responsive to the consumption of electrical energy of an electric load;

a timing motor means having an output rotated at a constant rate;

an on-off timing mechanism having a timing input rotatably driven in response to said output of said timing motor means, said on-off timing mechanism further including a releasable coupler means including a metering drive input and an output with said metering drive input connected to said watt-hour metering means, said coupler means being operable between coupling and decoupling states so as to connect and disconnect, respectively, said metering drive input and said output, and said on-off timing mechanism further including rotational means responsive to said timing input for rotation through a daily time cycle to effect the coupling and decoupling operation of said releasable coupler means during predetermined daily periods to establish said desired on-peak demand measuring period;

a maximum demand indicating means including a pusher drive and reset mechanism and a dial pointer for indicating maximum power demand of the load, said pusher drive and reset mechanism including a pusher drive operating input and a reset operating input with said pusher drive operating input connected to said output of said releasable coupler means only when said releasable coupler means is in said coupling state during said on-peak demand measuring period;

a demand interval timing means including an input driven in response to said output of said timing motor means and an output connected to said reset operating input of said pusher drive and reset mechanism, said demand interval timing means further including an intermittent motion arrangement connected between said input and output of the demand interval timing means to operate said reset operating input at predetermined demand intervals; and a time indicating mechanism including an input driven in response to said output of said timing motor so as to be driven therefrom in a common driven relationship with both said on-off timing mechanism and said demand interval timing means, said time indicating means further including a clock dial pointer and a manually adjustable time reset member, said reset member being operable to adjust the timing indicating mechanism so that said

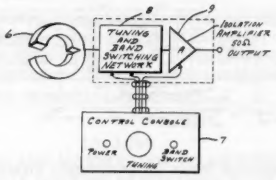
pointer is repositioned at a desired time setting and to concurrently reposition said on-off timing mechanism to maintain the same operative relationship therebetween whereby said desired on-peak demand measuring period occurs at predetermined daily periods indicated by said clock dial pointer.

3,913,015

TUNED CURRENT PROBE

Edwin L. Bronaugh, San Antonio, Tex., and Roger A. Southwick, Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,094
Int. Cl.² G01R 1/20, 19/00
U.S. Cl. 324—127 **3 Claims**



1. A current probe for detecting the current value of a line conducted electrical signal comprising

an inductive pick-off coil adapted for electromagnetic coupling to said line conducted electrical signal, and

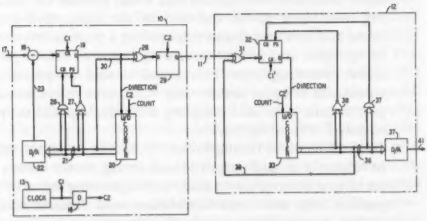
tuning means for tuning said inductive pick-off coil to resonate at the line conducted electrical signal frequency, said tuning means including at least one voltage variable capacitance diode connected in parallel with said inductive pick-off coil.

3,913,016

CIRCUIT FOR CURTAILING EFFECTS OF BIT ERRORS IN PULSE CODED TRANSMISSION

James Charles Candy, Convent Station, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1974, Ser. No. 461,879
Int. Cl.² H03K 13/22
U.S. Cl. 325—38 B **24 Claims**



24. In a communication system for difference pulse coded digital signals having successive digital signal times in which the digital signal state represents an amplitude step of at least one predetermined size in bipolar, variable, analog information,

means for indicating a change in polarity of said analog information, and

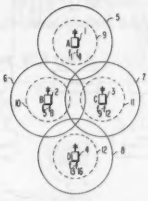
means, responsive to an output of said indicating means, for complementing subsequent ones of said digital signals after such polarity change.

3,913,017

CHANNEL SWITCHING DEVICE FOR MOBILE RADIO COMMUNICATION EQUIPMENT

Kazuo Imaseki, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 28, 1974, Ser. No. 455,836
Claims priority, application Japan, Mar. 28, 1973, 48-36024
Int. Cl.² H04B 1/10
U.S. Cl. 325—52 **2 Claims**



1. In a mobile radio communication system covering a service area divided into a plurality of zones each having a fixed base station and each accommodating a plurality of mobile stations, each base station having a plurality of frequency-divided communication channels exclusively assigned to it, the improvement in said mobile stations comprising:

a receiver and a transmitter having a common local oscillator input, detecting means responsive to a signal received by said receiver for comparing said received signal to a predetermined threshold,

channel switching means responsive to said detecting means for controllably switching between channels assigned to a zone in which said mobile station is located when said received signal exceeds said threshold and for controllably switching between all the channels in the service area when said received signal is below said threshold, said channel switching means including

switched local oscillator means for supplying local oscillation frequencies for all the channels in the service area to said common local oscillator input, said switched local oscillator means having a plurality of crystal resonators, and matrix means for selectively energizing one of said crystal resonators, and

counter means for selectively controlling said matrix means, said counter means including a reversible counter, a clock pulse source for incrementing or decrementing said reversible counter, and addition/subtraction control means responsive to said detecting means for controlling said reversible counter to add or subtract pulses from said clock pulse source.

3,913,018

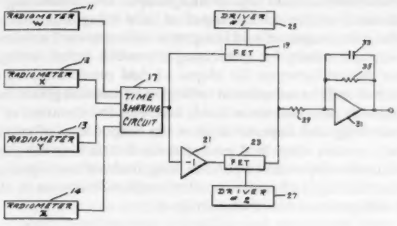
TIME SHARING RADIOMETER SYSTEM

Lyle E. Rasmussen, Arcadia, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1973, Ser. No. 366,909
Int. Cl.² H04B 1/10
U.S. Cl. 325—324 **1 Claim**

1. In a system for time sharing of a plurality of radiometric signals where each of the time shared signals has a time shared repetition period and a time sharing interval period and where the signals are fed to a pair of parallel field effect transistor channels each having a drive input with one of the channels being preceded by an inverter and the combined outputs of the two channels are followed by an integrator, the improvement comprising means for generating a pair of drive signals, said drive signals being 180 degrees out of phase, where each

of said drive signals is a square wave having a repetition period equal to the time shared repetition period of one of the radiometric signals and a pulse width equal to the time sharing interval period of said one radiometric signal.

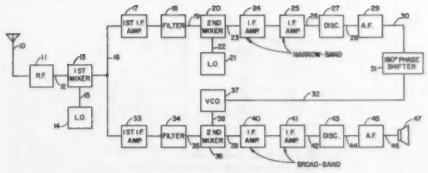


3,913,019

DOUBLE QUADRATURE FM RECEIVER

Ray Booth, Rte. No. 3, Box D5, Terrell, Tex. 75160

Filed Sept. 9, 1974, Ser. No. 504,501
Int. Cl.² H03D 7/16
U.S. Cl. 325—346 **7 Claims**



3. An FM receiver comprising first signal processing means to which an incoming frequency modulated carrier signal is applied as input and comprising signal conversion means including an injection oscillator to develope an i-f signal carrying the modulation intelligence imposed on said carrier signal, with said i-f signal being applied to demodulation means, the output of which comprises said modulation intelligence; second signal processing means comprising further signal conversion means including a further injection oscillator to develope an i-f signal, with said 1-f signal being applied to a further demodulation means, the output of which comprises the output of said receiver; said further injection oscillator comprising a frequency modulated oscillator; and feedback means applying the output of the demodulation means of said first signal processing means as a modulating signal input to said further injection oscillator, with said feedback being phased to effect a frequency deviation of the output of said further injection oscillator which is 180° out of phase with that of said incoming frequency modulated carrier signal.

3,913,020

ELECTRONIC TELEVISION TUNING SYSTEM

Peter Van Anrooy, Itasca, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

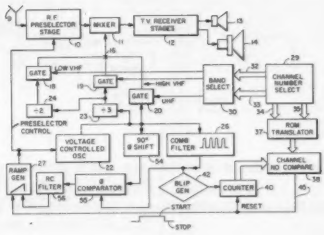
Filed Nov. 29, 1974, Ser. No. 528,077
Int. Cl.² H04B 1/16
U.S. Cl. 325—453 **16 Claims**

1. In a receiver including local oscillator means for producing signals at different frequencies for tuning the receiver to different received frequencies displaced from one another by a predetermined frequency spacing, a frequency selector system including in combination:

first circuit means coupled to the output of said local oscillator means and having a fundamental response frequency *f* equal to the frequency of said predetermined frequency spacing and producing sharply changed output signal levels for all frequencies *nf* where *n* is a whole number integer;

sweep means coupled with said local oscillator means for causing the signals from said local oscillator means to seep through a band of frequencies to cause said first circuit means output to change sharply for each frequency *nf*;

counter means coupled to said first circuit means for counting the sharp changes in the output signal level of said first circuit means;



recognition means responsive to a predetermined count in said counter means for stopping said sweep means when the signal produced by said local oscillator means reaches a frequency having a predetermined relationship with such predetermined count;

phase comparator means having a first input coupled with the output of said oscillator means and having a second input coupled with the output of said first circuit means for supplying a control signal to said oscillator means for maintaining the frequency of said oscillator at the frequency reached when said sweep means is stopped.

3,913,021

HIGH RESOLUTION DIGITALLY PROGRAMMABLE ELECTRONIC DELAY FOR MULTI-CHANNEL OPERATION

William F. McCarthy, Wappingers Falls, and Phillip R. Myers, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,029
Int. Cl.² H03K 5/13; H03B 3/04
U.S. Cl. 328—62 **19 Claims**

1. High resolution digitally programmable electronic apparatus for providing an accurately shaped and precisely timed first electrical pulse and an accurately shaped and precisely timed second electrical pulse, said electronic apparatus comprising:

a stable first oscillator providing a periodic output at a frequency of f_1 megahertz and a clock period of T_1 nanoseconds, where f_1 is a positive number greater than 100 and T_1 is equal to $1/f_1$;

a controllable second oscillator having a control input and providing a periodic output at a frequency of f_2 megahertz and a clock period of T_2 nanoseconds, where T_2 is equal to $1/f_2$, Nf_2 is equal to Mf_1, N and M are respectively positive integers and N is not equal to M;

phase detector means having first and second inputs and an output;

an M radix divider having its input connected to the output of said first oscillator and its output connected to said first input of said phase detector means;

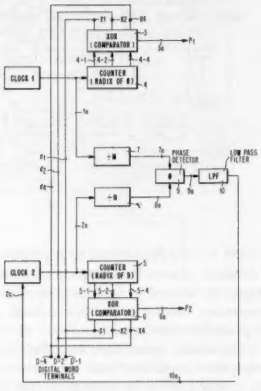
an N radix divider having its input connected to the output of said second oscillator and its output connected to said second input of said phase detector means;

low pass filter means intercoupling said output of said phase detector means and said control input of said second oscillator;

first and second binary counters each having an input, and each having a plurality of outputs respectively designated as 2^0, 2^1, 2^2, 2^3 - - 2^{n-1} and 2^n;

binary word manifesting means for manifesting a binary word having bit positions respectively designated 2^0, 2^1, 2^2, 2^3 - - - - - - - 2^{n-1} and 2^n;

first comparison means interconnecting said outputs of said first binary counter with said binary word manifesting means, said first comparison means having an output for providing said first electrical pulse when the binary count within said first counter is equal to the binary word manifested by said binary word manifesting means;



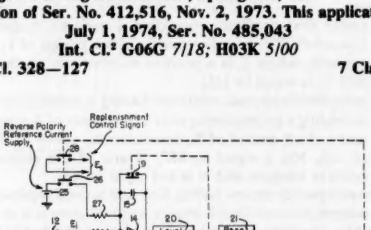
second comparison means interconnecting outputs of said second binary counter with said binary word manifesting means, said second comparison means having an output for providing said second electrical pulse when the binary count within said second counter is equal to the binary word manifested by said binary word manifesting means; whereby the time duration in nanoseconds between the occurrence of said first electrical pulse and the occurrence of said second electrical pulse is precisely selected and determined by the magnitude of the binary word manifested by said binary word manifesting means.

3,913,022

INTEGRATOR CONTROL CIRCUIT

Minoru Kinoshita, and Osami Taniuchi, both of Kyoto, Japan, assignors to Log Etronics Inc., Springfield, Va.

Division of Ser. No. 412,516, Nov. 2, 1973. This application July 1, 1974, Ser. No. 485,043
Int. Cl.² G06G 7/18; H03K 5/00
U.S. Cl. 328—127 **7 Claims**



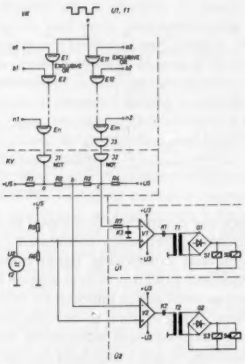
1. An integrator control circuit comprising signal integrator means, means coupling a signal to be integrated to the input of said integrator means, a reference source having a polarity opposite to that of said signal, timer means operative, upon elapse of a predetermined time interval subsequent to commencement of said signal integration, for connecting said reference source to the input of said integrator means to reduce the output of said integrator means toward a reference level, and means for generating a control signal during the time period between the elapse of said predetermined time interval and the subsequent reduction of said integrator means output to said reference level, whereby the duration of said control signal is dependent upon the output level of said integrator means when said predetermined time interval elapses, and is also dependent upon the magnitude of any signal present at the input of said integrator means subsequent to elapse of said predetermined time interval.

3,913,023

FAIL-SAFE LOGIC CIRCUIT ARRANGEMENT FOR USE IN RAILWAY SIGNALLING SYSTEMS

Klaus Dolch, Ludwigsburg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,477
Int. Cl.² B61L 23/00; H03B 3/04
U.S. Cl. 328—133 **5 Claims**



1. An improved fail-safe logic circuit for use in comparing binary control signals in railway signalling systems comprising:

a plurality of pairs of first and second exclusive-or elements, an input of one of said first elements coupled with an input of one of said second elements and to a source of square-wave test signals;

an output of each of said first exclusive-or elements connected to an input of another of said first elements in a continuing series of said first elements and an output of each of said second elements connected to an input of another of said second elements in a continuing series of said second elements;

a plurality of pairs of binary control signals, one of said signals from each said pair of binary control signals connected to one input of each of said first exclusive-or elements and another signal from each of said pairs of binary control signals connected to another input of each of said exclusive-or elements;

a pair of first and second not elements, an input of said first not element coupled with an output of one of said first exclusive-or elements and an input of said second not element coupled with an output of one of said second exclusive-or elements;

first, second, third and fourth resistors connected in series and to a source of d.c. voltage at said first resistor and to a source of d.c. voltage at said fourth resistor, an output

of said first not element coupled between said first and second resistors, and an output of said second not element coupled between said third and fourth resistors;

a first differential amplifier, one input of said first differential amplifier coupled with said third and fourth resistors and said output of said second not element, another input of said first differential amplifier coupled with an a.c. voltage source; and

a second differential amplifier having one input coupled between said second and third resistors and another input coupled with said other input of said first differential amplifier and said source of a.c. voltage;

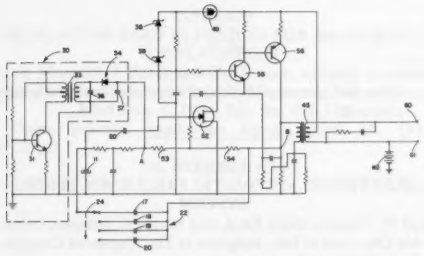
whereby when said pairs of binary control signals applied to inputs of said exclusive-or elements are in the same logic state an output signal appears at an output of said second differential amplifier and when said pairs of binary control signals applied to exclusive-or elements are not in the same logic state a signal appears at an output of said first differential amplifier.

3,913,024

CONDENSER MICROPHONE PREAMPLIFIER

R. Warren Necoechea, Tustin, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Aug. 14, 1974, Ser. No. 497,230
Int. Cl.² H03G *3/30*
U.S. Cl. 330—29 **6 Claims**



1. In an amplifier for a condenser microphone transducer, means for controlling the gain of said amplifier comprising:

means for providing a plurality of different capacitances,

means for selecting one of said capacitances,

means for coupling the output of said transducer to the amplifier, and

means for providing a negative feedback signal from said amplifier directly to said transducer through the selected capacitance.

3,913,025

SOLID STATE-VACUUM WIDEBAND AMPLIFIER

Mortimer H. Zinn, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 30, 1974, Ser. No. 510,516
Int. Cl.² H03F *3/60*
U.S. Cl. 330—33 **3 Claims**

1. A solid state-vacuum wideband amplifier comprising,

a wideband rf signal input means,

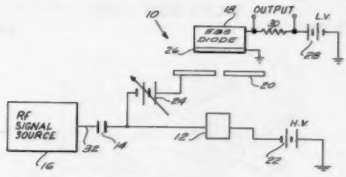
a strip-line for connection to an rf signal source,

an rf responsive cold cathode electron source, a stripline connected to said electron source,

said strip-lines being capacitively coupled whereby said cathode emits electrons in response to rf from said source,

an electron beam semiconductor current amplifying device responsive to incident bombarding electrons to generate an amplified current directly responsive to the bombarding electrons,

means for accelerating electrons emitted by said source toward said electron beam semiconductor current amplifying device,



means for focusing emitted electrons to bombard said semiconductor current amplifying device, and

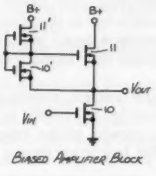
wideband rf signal output means connected to said current amplifying device.

3,913,026

MOS TRANSISTOR GAIN BLOCK

Dale R. Koehler, Westwood, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 459,169
Int. Cl.² H03F *3/16;* **H03K** *3/353, 19/08, 19/40*
U.S. Cl. 330—35 **6 Claims**



BIASED AMPLIFIER BLOCK

1. A solid-state gain block comprising:

A. a pair of like MOS transistors of the enhancementmode type, each having a source, a drain, a substrate and a gate, the substrate being connected to the source, one of said transistors functioning as an active amplifying element and the other as a variable resistance load element;

B. means connecting the drain of the active element to the source of the load element, thereby connecting said elements in series with respect to the voltage of a supply applied between the drain of the load element and the source of the active element;

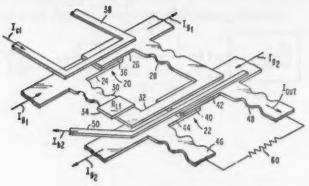
C. means to apply an input voltage to the gate of the active element and to derive an output voltage from the drain thereof; and

D. means coupling the gate of the load element to the drain of the active element, said enhancement-mode transistors being operated in their weak inversion region whereby a change in said supply voltage gives rise to a variation in the stage load resistance to a degree compensating for the resultant change in the transconductance of the active element, thereby maintaining the gain of the block despite said change in supply voltage.

3,913,027
HIGH GAIN, LARGE BANDWIDTH AMPLIFIER BASED ON THE JOSEPHSON EFFECT

Hans Helmut Zappe, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 319,588, Dec. 29, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,089
Int. Cl. H03F *15/00*
U.S. Cl. 330—61 A **16 Claims**

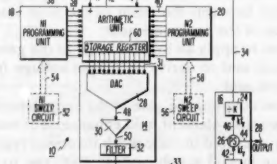


1. A wide band linear amplifier comprising,
a. first and second Josephson devices, each having a gain curve which is linear over a finite range of control current, and each being heavily damped and having damping resistances R_1 and R_2 respectively,
b. a first superconducting circuit including said first Josephson device and further comprising a super-conducting path having a load resistance R_{L1} therein in parallel circuit arrangement with said first Josephson device, and further superconductors for carrying a gating current I_{g1} to said parallel arrangement,
c. a second superconducting circuit including said second Josephson device and further comprising a superconducting path having a load resistance R_{L2} therein in parallel circuit arrangement with said second Josephson device, and further superconductors for carrying a gating current I_{g2} to said parallel arrangement,
d. said superconducting path having load resistance R_{L1} therein being positioned so that a portion thereof overlies said second Josephson device in a direction parallel to the direction of current flow through said second Josephson device, and
e. an input control current superconductor for carrying input control current positioned to overlie said first Josephson device parallel to the direction of current flow through said first Josephson device.

3,913,028
PHASE LOCKED LOOP INCLUDING AN ARITHMETIC UNIT

Robert Jan Bosselaers, Winchester, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,772
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **16 Claims**



1. The combination comprising:
first means for providing a first digital signal representing a number N1;
second means for providing a second digital signal representing a number N2;
third means for providing a third digital signal having a reference frequency f_R;
fourth means for providing a fourth digital signal having a variable frequency f_V;
arithmetic means, including storage means for storing a digital sum signal representing the results of arithmetic operations, said arithmetic means being responsive to said first, second, third and fourth digital signals for adding said number N1 to the contents of said storage means at a frequency f_R and subtracting said number N2 from the contents of said storage means at a frequency f_V to thereby generate said sum signal;
said fourth means further comprising a variable frequency means responsive to said sum signal for generating said fourth digital signal, said frequency f_V of said fourth digital signal varying in accordance with the contents of said storage means; and
output means coupled to said variable frequency means for generating an output signal having a frequency directly proportional to said frequency f_V;
the contents of said storage means remaining substantially constant when the total of the additions of N1 in a unit of time equals the total of the subtractions of N2 in said unit of time, said frequency f_V being directly proportional to

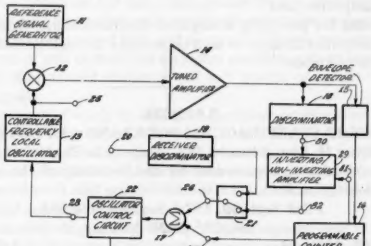
$$\frac{N1}{N2} f_R$$

when said contents of said storage means are substantially constant.

3,913,029
ELECTRONIC AUTOMATIC FREQUENCY TUNING SYSTEM

Fred W. Caspari, South Bend, and Wayne C. Johnson, Columbia City, both of Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed June 5, 1974, Ser. No. 476,484
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **7 Claims**



1. An electronic system for automatically tuning an oscillator to a selected frequency comprising:
a reference signal generator for generating a signal having a comb of reference frequencies;
a controllable oscillator;
oscillator control means for controlling the frequency of said oscillator;

mixer means for receiving signals from said signal generator and said oscillator and heterodyning same to produce an output signal having sum and difference frequencies;

tuned circuit means for receiving signals from said mixer means and for passing signals having a narrow band of frequencies centered about a predetermined beat frequency;

programmable means for receiving information designating said selected frequency, cooperable with said oscillator control means to initiate a frequency sweep of said oscillator beginning at an initial frequency, for detecting and counting occurrences of said predetermined beat frequency during said frequency sweep of said oscillator, and for causing said oscillator control means to terminate said frequency sweep of said oscillator upon detecting and counting a number of occurrences of said beat frequency determined by the information designating said selected frequency; and

discriminator means continuously connected to said tuned circuit means and to said oscillator control means for providing an output indicative of whether the signal passed by said tuned circuit means has a frequency above or below said predetermined beat frequency and effective upon termination of said frequency sweep of said oscillator to cause said oscillator control means to stabilize the frequency of said local oscillator at said selected frequency.

3,913,030
OSCILLATORS USED IN DEVICES FOR MEASURING A DISPLACEMENT

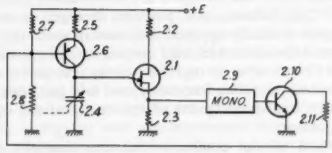
Louis Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Clichy, France

Filed June 4, 1974, Ser. No. 476,198

Claims priority, application France, June 15, 1973, 73.21823

Int. Cl.² H03K *4/50*

U.S. Cl. 331—65 **9 Claims**



1. Oscillator means operating from a voltage source for producing variable frequency output pulses in response to measurement of a physical displacement, said oscillator means including:

a capacitor having a variable element,

means responsive to a physical displacement to control said variable element and produce a variation in the capacitance value of the capacitor,

charging means connected to said capacitor and to said voltage source providing a current for charging said capacitor,

means connected to said capacitor and responsive to a threshold voltage charge thereon for discharging said capacitor each time said threshold voltage is sensed, said threshold voltage dependent upon the capacitance value of the capacitor,

and means connected to said charging means and responsive to its discharge of the capacitor for modifying the charging current for the capacitor for a predetermined time during its charging period.

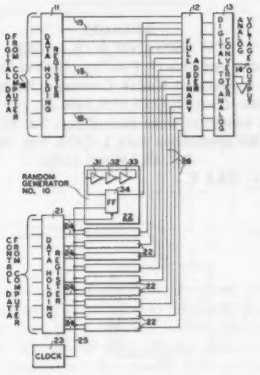
3,913,031
PSEUDO NOISE MODULATOR

Robert J. Membrino, Silver Spring, Md., assignor to The Singer Company, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,316

Int. Cl.² H03B *29/00*

U.S. Cl. 331—78 **9 Claims**



1. A digitally controlled system for applying a selected amount of noise to an information signal, said system comprising:

a. a plurality of digitally controlled noise generators;

b. means for applying a digital signal to each of said generators to turn on and off the output of said generators;

c. a multi-digit full parallel adder having a first set of inputs and a second set of inputs and a third set of outputs;

d. means for applying the outputs from said generators to said second set of inputs;

e. a source of information signals having its outputs applied to said first set of inputs;

f. a multi-input digital-to-analog converter; and

g. means for connecting said third set of outputs from said adder to the inputs of said converter whereby the output from said converter comprises a voltage whose amplitude depends upon the sum output of said adder.

3,913,032
GAS DISCHARGE LASER AND METHOD OF MANUFACTURING SAME

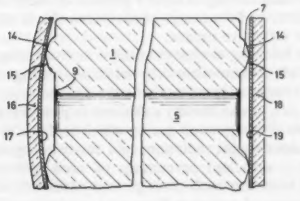
Petrus Franciscus Antonius Haans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 11, 1973, Ser. No. 378,268

Claims priority, application Netherlands, July 21, 1972, 7210089

Int. Cl.² H01S *3/22, 3/03*

U.S. Cl. 331—94.5 G **4 Claims**



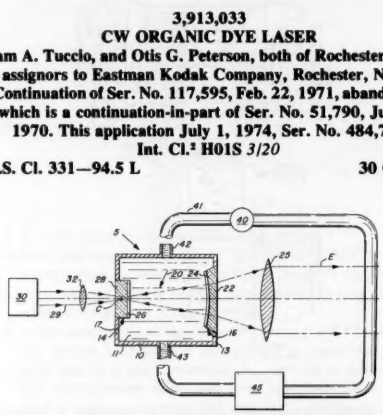
1. An arrangement, particularly for a gas discharge laser having reflector plates, comprising an elongated glass tube

interposed between the reflector plates and axially centered therebetween, said tube having a wall thickness relatively larger than its bore, and ends being in contact with said reflector plates, said ends being provided with annular ridges forming fitting edges for said tube in the laser against the reflector plates, said ridges including a first portion having a cross-section which includes an obtuse angle exceeding 170°, and a rounded second portion, said first portion being smaller in width than said rounded second portion.

3,913,033
CW ORGANIC DYE LASER

Sam A. Tuccio, and Otis G. Peterson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 117,595, Feb. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,790, July 2, 1970. This application July 1, 1974, Ser. No. 484,726
Int. Cl.² H01S 3/20
U.S. Cl. 331—94.5 L **30 Claims**



1. Apparatus capable of stimulating the emission of continuous-wave coherent radiation from a fluorescent organic dye solution containing organic dye molecules having a triplet-state lifetime less than

$$\frac{\lambda^4 F(\lambda)}{8\pi\, c\tau N^2 k_{ST} \sigma_T(\lambda)} \text{ seconds}$$

where λ is the wavelength of the coherent radiation; $F(\lambda)$ is the magnitude of the spontaneous fluorescence lineshape function at wavelength λ when $F(\lambda)$ is normalized so that $F(\lambda)\, d\lambda = \phi$,
where ϕ is the quantum yield for fluorescence; c is the velocity of light in free space; N is the refractive index of the solution; k_{ST} is the intersystem crossing rate constant; τ is the fluorescence lifetime; and $\sigma T(\lambda)$ is the molecular absorption cross-section for triplet-triplet transitions at the laser wavelength λ; said apparatus comprising:

a focused resonant cavity comprising first and second reflective means spaced from one another, at least one of said reflective means being effectively concave towards the other and having a radius of curvature not greater than a length substantially equal to the spacing between said reflective means;

means for maintaining at least a portion of such a solution in the vicinity of the center of curvature of said effectively concave reflective means;

means for focusing excitation radiation emanating from a source of continuous-wave radiation having spectral characteristics adapted to excite the dye molecules in said portion at a power density sufficient to produce a critical inversion in said portion during which said dye molecules spontaneously emit radiation, said cavity being shaped to redirect a sufficient percentage of such spontaneously emitted radiation back through said portion to stimulate the emission of radiation from said portion and produce laser action therein: and

means for continuously dissipating thermal energy produced during the excitation of said portion, from the vicinity of said portion to maintain sufficient optical homogeneity of said solution to permit focusing of said excitation radiation at the power density required for said critical inversion, and to permit said sufficient percentage of said stimulated radiation to be redirected back through said portion to produce laser action

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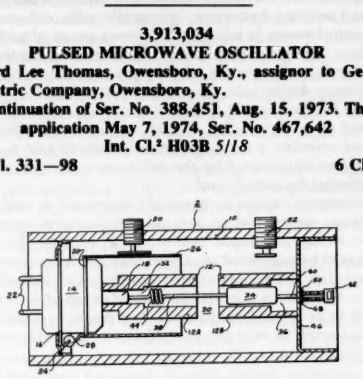
3,913,034
PULSED MICROWAVE OSCILLATOR

Edward Lee Thomas, Owensboro, Ky., assignor to General Electric Company, Owensboro, Ky.

Continuation of Ser. No. 388,451, Aug. 15, 1973. This application May 7, 1974, Ser. No. 467,642
Int. Cl.² H03B 5/18
U.S. Cl. 331—98 **6 Claims**



1. A high-frequency, pulsed mode, cavity oscillator comprising:

a. a first tubular conductor member;

b. a high-frequency triode tube disposed in said first member and having an anode, cathode and grid;

c. a second tubular conductor member coaxially disposed within said first member, said second member further comprising axially aligned first and second sections, said first section being electrically connected to said anode and having a portion axially spaced from said tube a first distance, said second section having a portion axially spaced from said device a second distance greater than said first distance, said portions arranged in an axially spaced, mutually opposed relationship such that a gap is formed therebetween, said second member forming with said first member an oscillator cavity resonant at a predetermined operating frequency; and said gap positioned at a high impedance point of the cavity at the operating frequency;

d. a third tubular conductor member coaxially disposed between said first and second members and electrically connected to said grid, said third member forming grid-cathode and plate-grid resonant cavities, respectively, with said first and second members;

e. a conductive means electrically connected between said first member and said second section for short-circuit terminating said oscillator cavity;

f. an input terminal insulated from said conductive means and adapted for connection to a pulsed input source; and

g. resistance means disposed within said second member and electrically connected between said input terminal and said anode.

3,913,035
NEGATIVE RESISTANCE HIGH-Q-MICROWAVE OSCILLATOR

Richard Calvin Havens, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,502
Int. Cl.² H03B 7/14
U.S. Cl. 331—107 R **8 Claims**

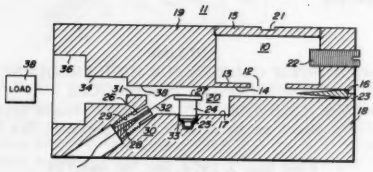
1. A negative resistance microwave oscillator comprising in combination:

a low-Q resonating means including a negative resistance device which is disposed into and within a cylindrical cavity for generating microwave energy in a range of predetermined frequencies;

bias means electrically connected to said negative resistance device for providing a direct current bias to said negative resistance device for providing a direct current bias to said negative resistance device of sufficient energy to generate said microwave energy;

a high-Q resonating means resonant at a predetermined frequency and electromagnetically connected in series with said low-Q resonating means for receiving said microwave energy from said low-Q resonating means and reflecting back a substantial portion of said microwave energy at said predetermined frequency to said low-Q resonating means to maintain microwave frequency oscillation at said predetermined frequency;

first dissipative means electromagnetically connected in series with said high-Q resonating means and said low-



Q resonating means for receiving said microwave energy at frequencies other than said predetermined frequency and dissipating said microwave energy at the undesirable frequencies to enhance frequency stability of the microwave oscillator;

first microwave transmission means electromagnetically coupled to said low-Q resonating means for transmitting said microwave energy supplied directly thereto from said low-Q resonating means at said predetermined frequency to an oscillator load; and

said bias means including transmission means electrically connected to said negative resistance device for applying direct current bias thereto, second dissipating means enclosing a first portion of said transmission means for dissipating microwave energy at undesired microwave frequencies, and coaxial transmission means enclosing a portion of said transmission means for directly reflecting back energy at said predetermined frequency to said negative resistance device.

3,913,036

HIGH-POWER, HIGH FREQUENCY SATURABLE CORE MULTIVIBRATOR POWER SUPPLY

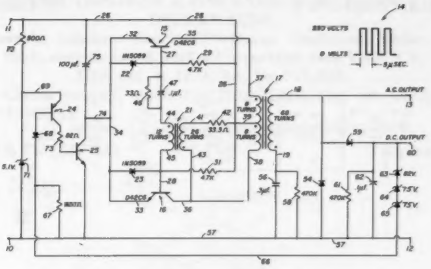
Glen C. Hook, Libertyville, Ill., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Aug. 16, 1974, Ser. No. 497,841
Int. Cl.² H03K *1/14, 3/30*
U.S. Cl. 331—113 A **6 Claims**

1. For use in a saturable core astable multivibrator power supply circuit operable to provide a high-power, high-frequency square wave output, said circuit including two alternately conducting high-power semiconductor switching means having significant parasitic junction capacitances and being in circuit with saturable core feedback transformer means operable to provide periodically reversing feedback voltage to said switching means for controlling alternate conduction thereof, a slow recovery diode means in circuit with each said switching means,

each said diode means being operable, when forwardly biased, to clamp its associated said switching means reversely biased and to provide a current path to forwardly bias its non-associated said switching means;

each said diode means having slow reverse recovery time, whereby, upon reversal of said feedback voltage to provide reverse bias on said diode means and forward bias on said associated switching means, residual stored charge on said diode means during said reverse recovery time maintains reverse bias on said associated switching means and provides reverse current for discharging junction capacitance of said non-associated switching means to render the latter non-conductive;



each said diode means having slow forward recovery time, whereby, upon reversal of said feedback voltage to forward bias said diode means, initial voltage overshoot developed across said diode means during said forward recovery time beyond the steady state forward bias voltage thereof heavily reversely biases said associated switching means to render the latter non-conductive;

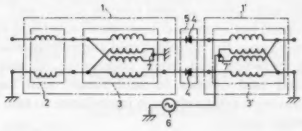
whereby both said slow recovery diode means cooperatively effect non-conduction of each said switching means prior to conduction of the other said switching means to minimize simultaneous switching means conduction and circuit power dissipation.

3,913,037

BROAD BAND BALANCED MODULATOR

Yusaku Himono, Shinagawa; Yuzo Kashiwayanagi, Yokosuka, and Mikio Murata, Shinagawa, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 425,293
Claims priority, application Japan, Dec. 23, 1972, 47-2047
Int. Cl.² H03C *1/54*
U.S. Cl. 332—43 B **5 Claims**



1. A broad band balanced modulator with a signal input side and a signal output side comprising:

a. first transformer means on the signal input side including a first toroidal line transformer of 1:1 turn ratio of primary and secondary windings and an unbalanced-to-balanced transformer;

b. second toroidal transformer means on the signal output side including a balanced-to-unbalanced transformer with a tap including a second line transformer of 1:1 turn ratio of primary and secondary windings;

c. rectifier means connecting the output of said first transformer means to the input of said second transformer means;

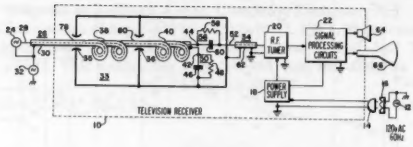
d. a local oscillator connected between ground and said tap; and,

e. the toroidal size of said first transformer means being larger than that of said second transformer means.

3,913,038
ELECTROMAGNETIC RADIATION FILTER FOR COAXIALLY FED HOT CHASSIS TELEVISION RECEIVER

George William Carter, Indianapolis, Ind., and Stephen Earl Hilliker, Tempe, Ariz., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,415
Int. Cl.² H03H 7/04, 7/06, 13/00
U.S. Cl. 333—70 R 18 Claims



1. In a television receiver adapted for coupling to an alternating current source for supplying operating power to said receiver, said source having an earth ground potential reference, said receiver including a conductive chassis coupled to said current source, a radio frequency tuner coupled to said chassis and coaxial cable means having inner and outer conductors for supplying radio frequency signals to said tuner, a radio frequency filter comprising:

first impedance means coupled between said chassis and said outer conductor at a first point for providing a relatively low impedance between said outer conductor and said chassis for radio frequency signals and for providing a relatively high impedance to said alternating current source;

second impedance means coupled between said chassis and said outer conductor of said coaxial cable at a second point for providing a relatively low impedance between said outer conductor and said chassis for radio frequency signals and for providing a relatively high impedance to said alternating current source;

means coupled at least to said outer conductor between said first point and said second point on said coaxial cable for providing an increase in series impedance associated with at least said outer conductor while maintaining the characteristic impedance of said coaxial cable; and

means coupled between said inner conductor and said radio frequency tuner for coupling said radio frequency signals existing between said inner conductor of said coaxial cable and said chassis to said tuner, said last-named means having a relatively high impedance to said alternating current source.

3,913,039
HIGH POWER YIG FILTER

Maurice Weiner, Ocean Township, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,256
Int. Cl.² H01P 1/20, 3/08, 7/00
U.S. Cl. 333—73 R 9 Claims

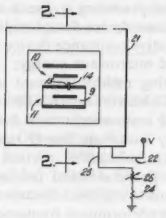
1. A high power YIG filter including an input transmission line;

an output transmission line;

a YIG sample mounted in close proximity and coupled to a dielectric resonator for connecting said input transmission line to said output transmission line, said dielectric resonator having a resonant frequency f_d;

a low pass filter having a cutoff frequency of f_d;

means for connecting said output transmission line to said low pass filter; and

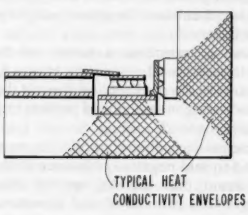


means for applying an adjustable magnetic field to said YIG sample.

3,913,040
MICROSTRIP CARRIER FOR HIGH FREQUENCY SEMICONDUCTOR DEVICES

Arye Rosen, Cherry Hill, N.J., and James Francis Reynolds, Beverly, Mass., assignors to RCA Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,724
Int. Cl.² H01P 1/30, 5/00; H01L 23/12
U.S. Cl. 333—84 M 7 Claims



1. A semiconductor device carrier comprising:

a thermally conductive substrate, said substrate being substantially L-shaped having a pair of legs with intersecting inner surfaces;

first and second semiconductor elements each element having two terminals, said first and second semiconductor elements generating heat when activated;

said first and second semiconductor elements being mounted on the inner surface of the respective legs adjacent the intersection of said inner surfaces and so arranged that a selected terminal of said first semiconductor elements is physically proximate to a selected terminal of said second semiconductor elements,

said substrate being a heat sink for said heat generated by said elements conducting said heat away from said first semiconductor element in a first heat conductivity envelope defining a first portion of said substrate and away from said second semiconductor element in a second heat conductivity envelope defining a second portion of said substrate; and

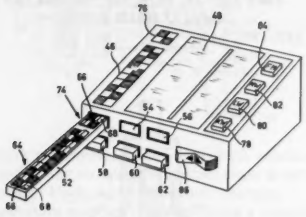
a short, direct electrical connection between said selected terminal of said first element and said selected terminal of said second element;

whereby the respective heat conductivity envelopes do not substantially overlap and parasitic reactances associated with said electrical connection are substantially minimized.

3,913,041
RADIO RECEIVER OR TELEVISION RECEIVER WITH PRE-SELECTION TUNING

Leon Pieter Weenink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,807
Claims priority, application Netherlands, June 14, 1973, 7308241
Int. Cl.² H03J 5/08; H01H 41/12
U.S. Cl. 334—7 3 Claims

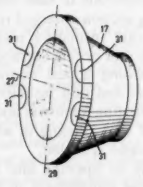


1. A tuning circuit for a receiver with pre-selection tuning and a tuning member which can be step-wise adjusted, said tuning circuit comprising a plurality of tuning means for achieving said step wise adjustment which can be switched on according to binary code combinations, at least one pre-selection switching member comprising a plurality of manually adjustable operating element means for switching on the tuning means in accordance with a code combination which is preselected by adjustment of the operating element means, and a binary display having indicating elements which displays the binary code combination associated with each tuning frequency and which enables the manual transfer of the code combination of the switching member, the spatial arrangement of the operating element means substantially corresponding to that of said indicating elements.

3,913,042
DEFLECTION COIL SYSTEM FOR COLOUR TELEVISION

Tjitte Talsma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,304
Claims priority, application Netherlands, Feb. 19, 1973, 7302257
Int. Cl.² H01F 7/00
U.S. Cl. 335—210 3 Claims

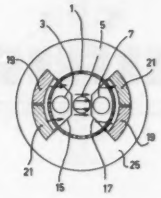


1. A deflection coil system for a colour television display tube having a partly flared outer surface and means for generating three electron beams which are situated substantially in one plane, the said deflection coil system comprising a first pair of saddle-like deflection coils which are adapted to the flared shape and which are arranged on both sides of a first deflection plane which, after mounting of the deflection coil system on the display tube, substantially coincides with the plane of the electron beams, a second pair of saddle-like deflection coils which are adapted to the flared shape and which are arranged on both sides of a second deflection plane which is perpendicular to the first deflection plane, a flared ferromagnetic ring core which encloses both coil pairs and which is divided into four quarters by the two deflection planes, and means for correcting raster distortion comprising the ring core provided with a recess in each of the four quarters at the area where its diameter is largest.

3,913,043
DEFLECTION DEVICE FOR A COLOR TELEVISION DISPLAY TUBE

Cornelis Johannes Henricus Paridaens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 511,048
Claims priority, application Netherlands, Oct. 10, 1973, 7313905
Int. Cl.² H01F 1/00
U.S. Cl. 335—212 2 Claims

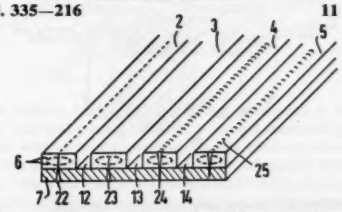


1. A deflection device for a color television display tube, which includes a device for generating three electron beams which are situated in substantially one plane and two parallel ferromagnetic correction plates, arranged between the central beam path on the one side and each of the outer two beam paths on the other side, the edges of the plates parallel to the beam paths being bent outwards, comprising two pairs of soft-ferromagnetic control members which are diametrically arranged with respect to the tube neck and which extend approximately at the area of the correction plates along the circumference of the tube neck at angles of less than 90°, the said pairs being rotable about the tube neck.

3,913,044
SUPERCONDUCTING MAGNET WITH RIBBON-SHAPED CONDUCTOR

Cord Albrecht, Erlangen, and Hans Lamatsch, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 18, 1973, Ser. No. 407,619
Claims priority, application Germany, Nov. 17, 1972, 2256594
Int. Cl.² H01L 39/02
U.S. Cl. 335—216 11 Claims



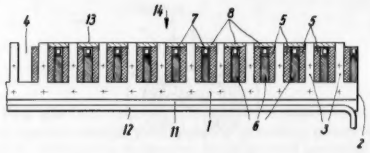
1. A ribbon-shaped conductor having improved transversal resistance comprising:
a planar strip member; and
a plurality of individual conductors, each having a plurality of superconductors embedded therein, welded to said strip member in parallel, spaced-apart relationship by a plurality of welds extending in the longitudinal direction of said individual conductors, with the welded seams

thereof being disposed approximately perpendicular to said strip member and approximately at the center of the surfaces of said individual conductors contacting said strip member.

3,913,045
LINEAR MOVING FIELD INDUCTOR FOR ELECTROMAGNETIC PUMPS, CONVEYOR TROUGHS OR AGITATOR REELS FOR LIQUID METALS

Axel Von Starck, Remscheid, Germany, assignor to AEG Elotherm G.m.b.H., Remscheid, Germany

Filed Aug. 5, 1974, Ser. No. 495,126
Claims priority, application Germany, Aug. 3, 1973, 2339318
Int. Cl.² H01F 27/08
U.S. Cl. 336—60 **8 Claims**

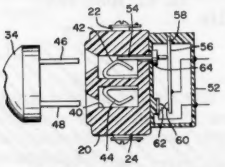


1. In linear moving field inductor for apparatus for moving molten metal having a laminated grooved inductor lamina bundle of magnetic material, in the grooves of which a multiphase induction coil is arranged, the improvement wherein each of the teeth of the lamina bundle is bounded on both sides by two grooves and enclosed in a single winding, the height of which is less than the depth of the grooves; and in each groove between the side surfaces of two adjacent single windings a heat-elimination device is inserted and connected thermally with the windings and connected at least on its side facing the groove opening with a groove cooling unit with one or more cooling pipes that are connected thermally with a groove-closing plate that closes off the groove opening.

3,913,046
CONDITION RESPONSIVE SYSTEMS

Claude A. Davis, 568 Piney Forest Road, and Joseph L. Stendig, 2500 Riverside Drive, both of Danville, Va. 24541

Continuation-in-part of Ser. No. 232,597, March 7, 1972. This application Oct. 9, 1973, Ser. No. 404,688
Int. Cl.² H01H 31/00, 61/00
U.S. Cl. 337—13 **35 Claims**

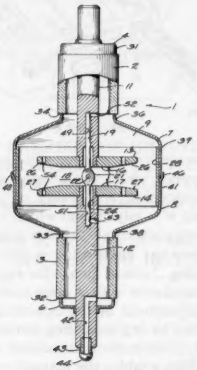


1. A thermally responsive system comprising:
piezoelectric crystal means producing an output signal in accordance with pressure applied thereto;
anchor means disposed in spaced relation to said piezoelectric crystal means;
arcuate bimetal means having a curvature defined by one end fixed to said anchor means and a movable end restrained by said piezoelectric crystal means for applying pressure thereto in accordance with a tendency to vary curvature in response to variations of a thermal condition; and
switch means responsive to changes in the output signal of said piezoelectric crystal means.

3,913,047
VACUUM FUSE

Michael E. Arthur, South Milwaukee; Harvey W. Mikulecky, Racine, both of Wis., and John W. Ranheim, San Jose, Calif., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Apr. 25, 1974, Ser. No. 464,103
Int. Cl.² H01H 61/00
U.S. Cl. 337—17 **17 Claims**



1. A vacuum fuse comprising, in combination,
means defining first and second spaced, generally parallel, confronting arcing surfaces arranged in general registry with each other,
fusible element means connected to and bridging the space between said arcing surfaces,
first and second electrically conductive contact rods electrically connected to said fusible element means and said arcing surfaces and projecting oppositely relative to the space between said arcing surfaces,
a housing including
an electrical insulating member surrounding a portion of and connected to each of said contact rods and each insulating member spaced from said arcing surfaces along a respective one of said contact rods,
a central housing section enlarged relative to and extending between said insulating members enclosing the space between said arcing surfaces,
and means providing a seal connection between said housing section and said insulating members and between said insulating members and contact rods so that the interior of said housing in which said arcing surfaces are arranged is sealed,
and means defining an opening into said housing interior through which the atmosphere in said housing interior can be evacuated and which can be sealed after a vacuum has been achieved in said housing interior.

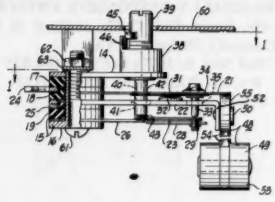
3,913,048
THERMOSTATIC SWITCH

Charles S. Mertler, 1012 Briarwood Road, Mansfield, Ohio 44907

Filed Feb. 25, 1974, Ser. No. 445,778
Int. Cl.² H01H 71/16
U.S. Cl. 337—67 **20 Claims**

1. A thermostatic switch comprising, in combination,

a rigid base,
a stack mounted on said base,
a resilient first contact blade mounted in said stack,
a substantially rigid second contact blade mounted in said stack,
first and second contacts on said first and second blades, respectively, and positioned for mutual cooperation,



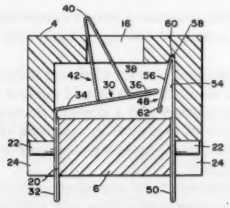
temperature responsive means supported relative to said stack and acting on said first contact blade to actuate said first contact blade with tempeature changes,
said temperature responsive means being a composite of a spring blade and a bimetallic blade connected in series and with said spring blade being fastened in said stack,
and adjusting means acting between said base and said temperature responsive means for adjustment of the operating temperature of said contacts.

3,913,049

THERMOSTATIC CIRCUIT BREAKER

Lyndon W. Burch, Boston, Mass., assignor to B/K Patent Development, Inc., Highland Park, Ill.

Continuation-in-part of Ser. No. 346,918, April 2, 1973. This application Oct. 26, 1973, Ser. No. 409,911
Int. Cl. H01h *71/16*
U.S. Cl. 337—75 **28 Claims**



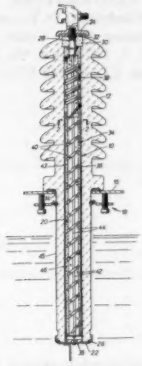
1. A two-break circuit breaker comprising:
a base;
a pair of spring arms mounted on the base and adapted to occupy a first contact-closed position and a second contact-open position, the arms each being resiliently biased toward contact-open position, and one end portion of each spring arm constituting an electrical contact, and the other end portion constituting an electrical terminal;
thermal latch means mounted on the base and comprising a thermostat metal element, the element having a mounting leg and at least two first legs attached by one end of each to the mounting leg, each first leg being adapted to be in a first position when at one position and in a second position when at another temperature, the other end of each of the first legs being adapted respectively to engage said one end of a spring arm when at the first temperature, thereby to make electrical contact therewith; and each of said first legs when in said second position being disengaged from the respective spring arm;
manually actuable means for imparting relative motion between the spring arms and said first legs thereby to cause reengagement with the ends of the spring arms and the ends of said first legs in contact-closed position.

3,913,050

FUSE ASSEMBLY FOR CURRENT LIMITING FUSES

Harvey W. Mikulecky, Racine, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed June 3, 1974, Ser. No. 475,440
Int. Cl.² H01H *85/04*
U.S. Cl. 337—159 **10 Claims**



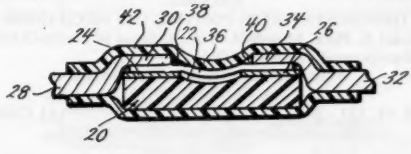
1. A high voltage fuse of the current limiting type, a tubular insulating casing, terminals on the ends of said casing, a spider of heat resistant insulating material positioned in said casing, a fusible element having a plurality of reduced area sections, said element being helically wrapped around said spider and interconnecting said terminals, said spider contacting only portions of said fusible element at points between reduced area sections of said fusible element, and granular inert refractory, arc-quenching material within said casing embedding said spider and said main fusible element.

3,913,051

PROTECTOR FOR ELECTRIC CIRCUITS

Clifford O. Manker, St. Louis, and Craig L. McAlister, Florissant, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Filed May 22, 1974, Ser. No. 471,846
Int. Cl.² H01H *85/44*
U.S. Cl. 337—279 **15 Claims**



1. An electric fuse which comprises a support, a terminal adjacent one end of said support, a second terminal adjacent the other end of said support, a fusible element electrically connecting said terminals, and a housing of readily shrinkable material which encloses and protects said fusible element, said housing of readily shrinkable material having portions thereof shrunk into engagement with and enclosing portions of said support and of the inner ends of said terminals, said terminals extending outwardly through and beyond the ends of said housing of readily shrinkable material to have the outer ends thereof engageable with spaced-apart components of an electric circuit to be protected by said electric fuse, said terminals having said inner ends thereof spaced apart a predetermined distance, said fusible element responding to a potentially-hurt-

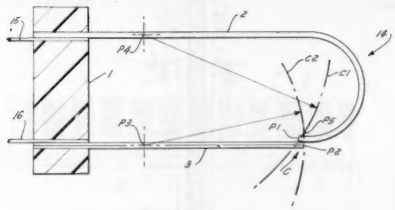
ful overload of predetermined duration to fuse and thereby open said electric circuit, said spacing apart of said inner ends of said terminals acting to minimize or prevent burning of said inner ends of said terminals when said fusible element fuses to open said electric circuit.

3,913,052

CIRCUIT BREAKING DEVICE FOR VERY HIGH TEMPERATURE

Colin D. Hickling, Woodstock, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,497
Int. Cl.² H01H *37/62*
U.S. Cl. 337—346 **15 Claims**



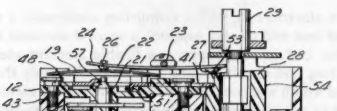
1. In a temperature sensing circuit breaking device the combination comprising a support, first and second elements secured to and extending from said support, said first element being movable from a first through a second to a third position, said first element being biased toward said first position, an end thereof moving along an arc between said first and third positions; said second element comprising temperature sensitive means effective in response to a change of temperature in a given sense to move an end of said second element along a second arc and in a given direction from said first toward said third positions, said first and second arcs intersecting at said third position, said element ends engaging at said second position; and electrical contacts operatively connected to at least one of said engaging element ends to be in contact only when said element ends are engaged, whereby when said second element moves in said given direction its said end first moves said first element away from said second position toward said third position thereof and then moves out of the path of said first arc, said first element then moving to its said first position to disconnect said electrical contacts and break the circuit.

3,913,053

THERMOSTAT WITH POSITIVE-OFF MECHANISM

Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Oct. 15, 1973, Ser. No. 406,538
Int. Cl.² H01H *37/12*
U.S. Cl. 337—347 **11 Claims**



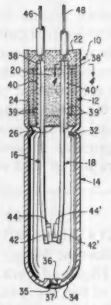
1. A thermostat comprising a body, a switch on said body, a bimetallic snap disc connected to operate said switch, adjustment means including a control element movable to adjust the operating temperature of said disc, and a positive-off mechanism operable by movement of said control element to a predetermined position to render said disc incapable of operating said switch without restraining the movement of said disc.

3,913,054

THERMALLY RESPONSIVE SWITCH

Denis G. Wolfe, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 8, 1973, Ser. No. 414,025
Int. Cl.² B23Q *3/00*; H01H *37/52*
U.S. Cl. 337—362 **16 Claims**



1. A thermally responsive switch comprising

a ceramic container having a base with a pair of slots therein;

a pair of elongated contact elements including at least one bimetallic element, each of said contact elements having an anchor portion and a contact portion and extending through one of said slots in said base of said container, said anchor portions being disposed interiorly of said container; and

a mass of inorganic base, chemical setting cement disposed in said container surrounding said anchor portions of said contact elements and cured to interact with said container to form a hardened integral support for said contact elements holding said anchor portions rigid whereby said contact portions of said contact elements are engageable and relatively movable to assume a predetermined relationship at a particular temperature.

3,913,055

PHOTOCONDUCTIVE VARISTOR

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

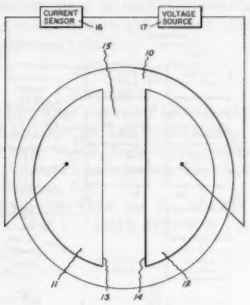
Continuation of Ser. No. 319,330, Dec. 29, 1972, abandoned.
This application July 1, 1974, Ser. No. 484,480
Int. Cl.² H01C *7/08*
U.S. Cl. 338—15 **10 Claims**

1. A photoconductive varistor comprising:

a body of sintered polycrystalline, varistor material comprising zinc oxide and bismuth oxide and further characterized as comprising a plurality of zinc oxide grains of relatively high conductivity and an intergranular layer of material of relatively low conductivity and having at least one surface; and

a pair of electrodes disposed on said surface and having a

gap therebetween, said gap providing for illumination of said surface by electromagnetic energy and providing an



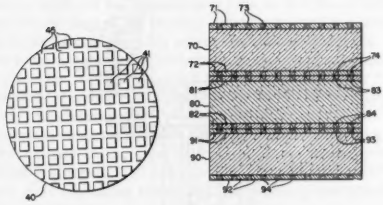
electric current path between said electrodes through said polycrystalline varistor material.

3,913,056

VARISTORS WITH PATTERNED ELECTRODES

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 1, 1974, Ser. No. 484,610
Int. Cl.² H01C 7/12
U.S. Cl. 338—21 **10 Claims**



1. A polycrystalline varistor element for inclusion in a series stack of such polycrystalline varistor elements for high voltage surge protection comprising:

a body of polycrystalline varistor material having a pair of opposed flat faces; and

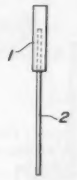
a plurality of conductive electrode elements applied to spatially separated areas on each of said opposed flat faces for providing electrical contact to said body, said electrode elements being separated, one from another, and adapted so that electric current flow between said separated areas is confined to said body of varistor material.

3,913,057

OXYGEN ION TRANSPORT TYPE THERMISTORS

Yoshiro Ushida, Toyoake, and Shinji Nishio, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed June 14, 1974, Ser. No. 479,472
Claims priority, application Japan, June 21, 1973, 48-70493
Int. Cl.² H01C 7/04
U.S. Cl. 338—22 R **2 Claims**



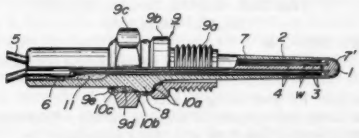
1. An oxygen ion transport type thermistor comprising an oxygen ion type solid solution consisting of 50–95 mol percent of at least one metal oxide selected from the group consisting of ZrO_2, CeO_2, HfO_2 and ThO_2, and 5–50 mol percent of at least one metal oxide selected from the group consisting of CaO, MgO, SrO, La_2O_3, Y_2O_3, Yb_2O_3, Sc_2O_3, Gd_2O_3 and Nd_2O_3, and two metal lead wires are embedded in said solution and held in an adequately spaced parallel relationship to each other and lying substantially in the center line in the thickness direction of said solution and that the porosity of said oxygen ion transport type solid solution is 7–55 percent.

3,913,058

THERMOSENSOR

Shinji Nishio, Nagoya; Yoshiro Ushida, Aichi, and Shunkichi Nozaki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed July 17, 1973, Ser. No. 380,056
Claims priority, application Japan, July 25, 1972, 47-74473
Int. Cl.² G01K 1/08
U.S. Cl. 338—28 **17 Claims**

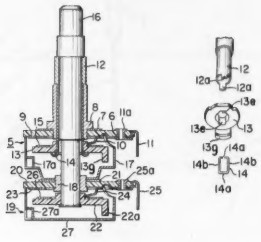


1. A thermosensor comprising a two-holed ceramic tube, a lead wire passing through each of the two holes, a heat-sensitive element connected to the lead wires at one end of the two-holed ceramic tube, an outer ceramic protective tube having an outwardly circular bulging portion or collar at about the middle of the length thereof, a tubular metallic casing coaxially supporting the protective tube and caulking over the circular bulging portion, and powdery fillers filled in the space between the protective tube and the metallic casing.

3,913,059
VARIABLE RESISTOR HAVING FRONT AND BACK STAGES OPERATED BY CONCENTRIC SHAFTS COUPLED IN ROTARY OPERATION BY FRICTION THROUGH A SPRING

Hiroshi Matsui, Neyagawa, and Tadashi Mihara, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 14, 1974, Ser. No. 497,340
Claims priority, application Japan, Aug. 20, 1973, 48-97698; Apr. 1, 1974, 49-37676; Apr. 1, 1974, 49-37677
Int. Cl.² H01C *10/20*; G05G *1/08*, *13/00*
U.S. Cl. 338—131 **7 Claims**



1. A variable resistor wherein a front-stage variable resistor operated by an outer shaft and a back-stage variable resistor operated by an inner shaft fitted concentrically in said outer shaft are arranged in the axial direction of both shafts and these shafts are coupled in rotary operation by friction through a spring which compresses against the circumferential surface of the inner shaft characterized in that said spring is made by bending an elastic wire material into a rectangular shape, the shorter elements of the said spring being fixed to the end of said outer shaft together with a brush-mounting plate of the front-stage variable resistor by clinching end projections of said outer shaft, said spring being passed through by said inner shaft, and the longer elements of said spring compressing against the circumferential surface of said inner shaft so that a frictional force is produced between the longer elements of said spring and the circumferential surface of said inner shaft.

3,913,060
THERMOOPTIC SONAR SYSTEM

Peter J. Westervelt, Providence, R.I.; Richard S. Larson, East Hartford, Conn., and Thomas G. Muir, Austin, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1974, Ser. No. 447,599
Int. Cl.² G01S *9/66*
U.S. Cl. 340—3 R **5 Claims**

1. An improved thermooptic sonar system for location of remote targets comprising:

a. a laser for generating a laser beam;

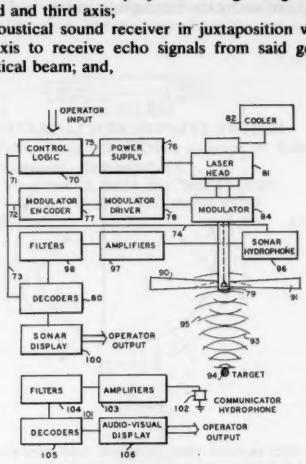
b. a elongated cylindrical housing having a first major axis filled with a non-light absorbing material;

c. means for directing said laser beam along said first major axis;

d. a beam splitter positioned on said first major axis, said beam splitter splitting said laser beam and projecting said laser beam along a second and a third axis;

e. optical windows in said housing positioned along said second and third said axis allowing said split laser beam to be projected along said second and third said axis into water, said beam being absorbed along said second and third said axis, causing heat in small increments in water along said axis thereby causing thermal expansion of said small incremental portions in said water, and generating a sound wave that is projected at right angles to said second and third axis;

f. an acoustical sound receiver in juxtaposition with said first axis to receive echo signals from said generated acoustical beam; and,

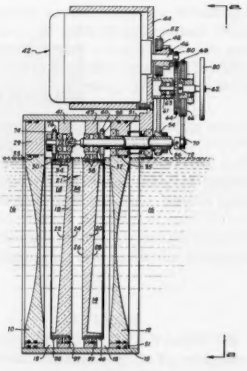


g. circuitry coupled to said receiver and said laser to process signals from said laser and said receiver to display return echoes from remotely spaced targets.

3,913,061
FOCUSING AND DEFLECTING SYSTEM FOR ACOUSTIC IMAGING

Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Apr. 25, 1973, Ser. No. 354,236
Int. Cl.² G10K *11/06*
U.S. Cl. 340—5 MP **23 Claims**



1. In an acoustic imaging and image deflection system for sweeping a compressional acoustic image field past a given line so that every portion of the image field moves past that line, at least a pair of acoustic wedges rotatably mounted in axially aligned relationship along the path of incidence of a compressional image field, each of said acoustic wedges having at least one planar surface forming an angle with the axis of said path of incidence and substantially parallel to the corresponding surface on the other for a given rotational position and means to rotate said acoustic wedges in opposite rotational senses at equal angular displacements while main-

taining the said axial alignment whereby the said planar surfaces are substantially parallel for two positions during rotation and whereby the transmitted compressional image field is periodically swept orthogonally past a line perpendicular to the said axis of alignment and lying in a plane containing the said axis of alignment once in each direction for each full rotation of said acoustic wedges and without rotary or lateral displacement with respect thereto.

3,913,062

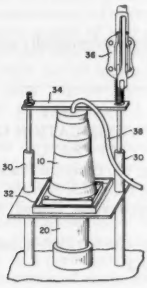
QUICK CONNECT/DISCONNECT DUMILOAD SONAR TRANSDUCER TEST METHOD

Eugene M. Spurlock, Menlo Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,511

Int. Cl.² H04R *29/00*

U.S. Cl. 340—5 C **3 Claims**



1. A method for coupling a high-power transducer to be tested to a dummy impedance-load transducer such that there may be a quick connection and disconnection from the test apparatus comprising the steps of:

placing a reservoir bath filled with a fluid couplant around the upper section of the dummy impedance-load transducer adjacent to its transducer face so that the interface where the face of the dummy impedance-load transducer and the face of the high power transducer under test are to meet is completely immersed in said fluid couplant;

lowering the transducer under test facedown into the bath until there is only a thin fluid film between the faces of the two transducers; and

applying a mechanical force of at least 10 to 15 p.s.i.g. to the tail-end of the case of the transducer under test to force a close contact between the faces of the transducers, thus increasing their effective bonding and preventing cavitation.

3,913,063

GEOPHONE WITH PLASTIC COILFORM

Harold A. Sears, Conroe, Tex., assignor to Walker, Hall, Sears, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 399,361, Sept. 21, 1973, Pat. No. 3,878,504. This application Oct. 23, 1973, Ser. No. 408,774

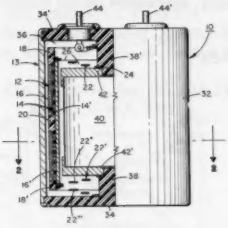
Int. Cl.² G01V *1/16*

U.S. Cl. 340—17 **3 Claims**

1. In a seismic electromagnetic geophone including a case having an internal chamber and an inductive coil adapted to oscillate in a magnetic field to generate electric signals responsive to the vibrations of said case, a nonmetallic coilform upon which said coil is wound, a metallic cylinder adapted to oscillate in unison with said coilform, the improvement wherein,

said coilform is mounted on the outer cylindrical wall of said metallic cylinder and secured thereto in rigid relation,

said magnetic field is produced by a single magnet which generates electric signal currents in said inductive coil



and which also generates electric eddy currents in said metallic cylinder, said eddy currents producing damping forces on said coilform.

3,913,064

VEHICLE WARNING SYSTEMS

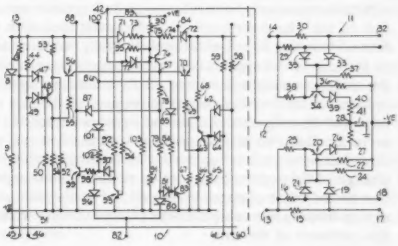
Peter Hugh Salway, Birmingham, and Andrew Stephen Todd, Stafford, both of England, assignors to The Lucas Electrical Company, Birmingham, England

Filed Feb. 1, 1974, Ser. No. 438,660

Claims priority, application United Kingdom, Mar. 3, 1973, 10453/73

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **2 Claims**

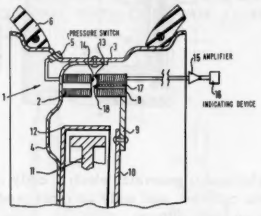


1. A tractor-trailer vehicle having a warning system comprising a first unit mounted on the tractor, a second unit mounted on the trailer, and a single electrical signal carrying line connected between said first and second units, said second unit including first and second switch means operable in response to at least two trailer conditions respectively, said first and second switch means when operated varying the electrical signal on said single line by a different degree and said first unit including means operable in response to said electrical signal to provide an indication of the nature of the condition, said first and second switch means operating in response respectively to two different failures on the trailer, having a predetermined current flow when neither switch means is operated, the first switch means serving when operated to reduce the current to a first level and a second switch means serving when operated to reduce the current to a second and lower level, the tractor including a first warning device which is operated when the current falls to the first level and a second warning device which is operated when the current falls to the second level.

3,913,065
TIRE DEFLATION DETECTION

Eric Gordin Gould, Sutton, England, assignor to Dunlop Limited, London, England

Filed June 28, 1973, Ser. No. 374,665
Claims priority, application United Kingdom, July 6, 1972, 31619/72
Int. Cl.² B60C *23/04*
U.S. Cl. 340—58 **5 Claims**



1. Apparatus for detecting the reduction of inflation pressure of a pneumatic tire mounted on a wheel on a vehicle, said apparatus comprising:

a first circuit mounted on the wheel to rotate therewith, the first circuit comprising a first coil and a pressure responsive switch electrically connected thereto, the switch having an open and a closed position and being changeable from one of the positions to the other on decrease of inflation pressure below a predetermined value,

a second circuit non-rotatably mounted on the vehicle, said second circuit comprising a second coil and an indicating device electrically connected thereto, and a bar magnet located coaxially within the second coil,

the first and second coils being disposed on the wheel and vehicle respectively, whereby once during each revolution of the wheel they are coaxially juxtaposed with the first coil moving in a direction substantially perpendicular to the axis of the second coil and the bar magnet and, if the pressure switch is closed, a first electric signal is induced in the first coil due to movement of the first coil adjacent the magnet and a second signal is induced in the second coil due to its juxtaposition with the first coil and said second signal actuates the indicating device, the change of the pressure responsive switch from one position to the other changes the signal fed to the indicating device to warn the vehicle driver of the decrease in inflation pressure of the tire.

3,913,066
ALARM DEVICE FOR MOTOR VEHICLES

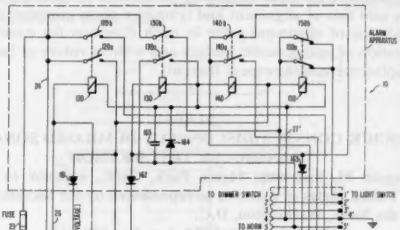
Manfred Kehry, Weil, and Manfred Pospiech, Nagold, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 17, 1973, Ser. No. 407,168
Claims priority, application Germany, Oct. 17, 1972, 2250733
Int. Cl. B60r *25/10*
U.S. Cl. 340—63 **27 Claims**

1. In an alarm installation for a vehicle, said vehicle having an electrical system with a source of electrical power, signalling means operatively connected to said electrical system for activation by the power source, and pulse transmitter means connected to said electrical system for providing intermittent signals to said signalling means, the alarm installation comprising

circuit means for producing alarm signals, said circuit means being connected to said pulse transmitter means for providing intermittent alarm signals, and

multi-pole adapter plug means connected to said circuit means for supplying said alarm signals to said signalling means, said multi-pole adapter plug means introducing said alarm signals into said electrical system for activating

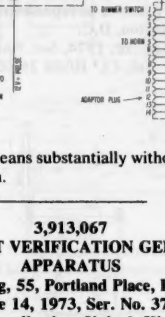


said signalling means substantially without change of said electrical system.

3,913,067
CHECK DIGIT VERIFICATION GENERATION APPARATUS

Leslie Louis Goldberg, 55, Portland Place, London, England

Filed June 14, 1973, Ser. No. 370,143
Claims priority, application United Kingdom, June 14, 1972, 27806/72
Int. Cl.² H03K *13/34*; G06F *11/10*; G06K *5/02*; H04L *1/10*
U.S. Cl. 340—146.1 AJ **21 Claims**



1. A keyboard apparatus for generating check digits for use with sequences of decimal digits, including

a. a plurality of manually-operable keys of which at least ten (referred to hereafter as decimal digit keys) represent the 10 respective decimal digits,

b. a plurality of electric switching means associated with the respective decimal digit keys and operative to change from a first to a second switching state on operation of the associated decimal digit key,

c. electric encoding means having input circuit means connected with the respective switching means, and output circuit means at which are delivered electric "digit value" signals representative of the particular electric switching means then in said switching state,

d. electric indexing means having input circuit means connected with each of said electric switching means and being responsive to the changing of any one of said switching means to said second switching state, and electric output circuit means at which are delivered electric "digit position" signals representative of the position in a sequence of decimal digits being keyed in, by sequential operation of the appropriate decimal digit keys, of the decimal digit last keyed in,

e. "remainder value" signal producing means having first input circuit means connected to receive signals from said output circuit means of said encoding means, second input circuit means connected to receive signals from said output circuit means of said indexing means, and output circuit means at which is delivered in response to corresponding digit value and digit position signals delivered to said first and second input circuit means an electric "remainder value" signal representative of a predetermined remainder value corresponding to the digit value and digit position of a decimal digit just keyed in by operation of a selected decimal digit key.

f. an electric "accumulated remainder value" signal storage means having an input circuit means, first and second output circuit means, and a reset circuit means connected to receive 'reset' signals from said output circuit means of said indexing means,

g. an electric adding means having a first input circuit means connected to receive signals from said output circuit means of said signal producing means, a second input circuit means connected to receive signals from said first output circuit means of said signal storage means, and an output circuit means connected to deliver "sum" signals to said input circuit means of said signal storage means, which "sum" signals represent the sum of the signals received at said first and second input circuit means, and

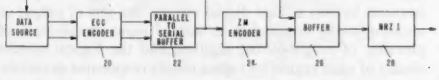
h. an output device connected to receive signals from said second output circuit means of said signal storage means, and having output circuit means at which are delivered, after the sequence of decimal digits has been keyed in, check digit signals representative of the deviation of the signal then stored in said signal storage means from the nearest multiple of a predetermined modulus number.

each of said predetermined reminder value being the excess, over the nearest multiple of the modulus number, of the associated decimal digit value when multiplied by a predetermined multiplier dependent on the position in said sequence of the particular decimal digit.

3,913,068
ERROR CORRECTION OF SERIAL DATA USING A SUBFIELD CODE

Arvind M. Patel, San Jose, Calif., assignor to IBM Corporation, Armonk, N.Y.

Filed July 30, 1974, Ser. No. 493,195
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AL **9 Claims**



1. An error correction system for data bytes D to be arranged serially on a recording medium, comprising:

encoder means for generating two check bytes C_1 and C_2 from k data bytes spaced n data bytes apart from each other in the serial sequence wherein the first check byte $C_1 = D_1 \oplus D_2 \oplus D_3 \ldots \oplus D_k$ and second check byte $C_2 = T \lambda D_1 \oplus T^2 \lambda D_2 \oplus T^3 \lambda D_3 \ldots \oplus T^k \lambda D_k$ where T is the companion matrix of a binary primative polynomial $g(x)$ of degree f and λ is any integer given by the expression $t(2^f-1)/(2^b-1)$ in which t is any positive integer prime to 2^b-1;

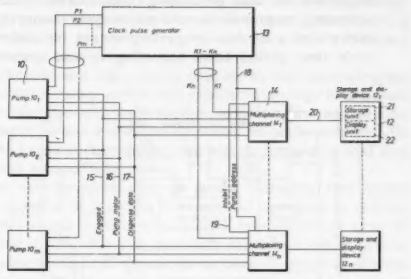
means for adding these $2n$ check bytes at the end of the string of $k \times n$ data bytes they are produced from and,

synchronization pulse means providing a periodic synchronization burst of non data pulses in series with the data byte to synchronize the data.

3,913,069
SELF SERVICE SYSTEM

Sten E. Rundin, Bromma, and Jan H. Westlund, Akersberga, both of Sweden, assignors to Auto Tank AB, Stockholm, Sweden

Filed Oct. 21, 1974, Ser. No. 516,219
Int. Cl.² G06K *7/08*
U.S. Cl. 340—147 A **10 Claims**



1. A self service system comprising:

a first number of dispensing units;

a second number of storage and display devices at a cashier location; and

means for automatically connecting a dispensing unit, when it becomes occupied, to any free one of the storage and display devices, such that data regarding the dispensing operation of said dispensing unit can be transferred to the selected storage and display device,

said means being arranged to break said connection between said dispensing units and said storage and display device automatically as soon as the occupation of said dispensing unit is terminated, whereby said dispensing unit is free to be used again immediately together with any other free storage and display device.

each storage and display devive being arranged after a connection to remain in an occupied state while retaining dispense data received during said connection at least until an acknowledgement corresponding to said dispense data has taken place.

3,913,070
MULTI-PROCESSOR DATA PROCESSING SYSTEM

Donald H. Malcolm, Minneapolis, Minn., and Matthew E. Kramer, San Jose, Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Feb. 20, 1973, Ser. No. 333,770
Int. Cl.² G06F *9/18, 15/16*
U.S. Cl. 340—172.5 **22 Claims**

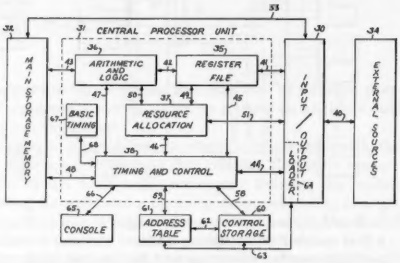
1. An improved data processing system, comprising:

a. a plurality of data processing means each configured for executing data processing tasks on and in response to received digital information, said plurality of data processing means including shared common resource circuit means comprising data storage means, arithmetic and logic means, and timing and control means, said plurality of data processing means further having circuit means responsive to said execution of tasks by each of said data processing means for generating request output signals indicative of real time requirements for use of said shared common resource circuit means by each of said plurality of data processing means in the execution of its respective said data processing task;

b. input/output means operatively connecting at least one of said plurality of data processing means with external sources for transfer of said digital information therebetween;

c. basic timing circuit means for generating major cycle timing signals wherein the duration of a major cycle approximates one or more storage reference cycles of said data processing system up to that period of time required by said system to execute an instruction; and

d. control means in circuit with said plurality of data processing means and with said basic timing circuit means for determining relative real time needs of said plurality of data processing means for operative use of said shared common resource circuit means in the execution of their respective said data processing tasks, and for selectively activating, responsive to said major cycle timing signals, said plurality of data processing means on said major cycle time period basis according to said determined



relative real time task execution needs, said control means comprising:

1. means operatively connected to receive said plurality of request output signals, being responsive thereto and to said major cycle timing signals for processing means for use of said shared common circuit means; and

2. activating means responsive to said need determination output signals and to said major cycle timing signals for sequentially selectively activating said plurality of data processing means on contiguous major cycle time periods by operatively allocating use of said shared ocmmon resource circuit means among said plurality of data processing means in a manner such that each successively activated one of said data processing means actively executes its respective data processing task for the entire duration of that major cycle time period in which it is activated, without delay for selection operations of said control means.

3,913,071

DATA TERMINAL HAVING INTERACTION WITH CENTRAL SYSTEM

Frank John Garofalo, Jr., Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

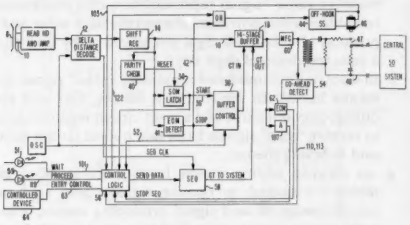
Filed July 16, 1973, Ser. No. 379,690
Int. Cl. G06f *3/08*
U.S. Cl. 340—172.5 **10 Claims**

1. In the data entry system, a central system and a terminal comprising means adapted to accept entry of data for transmission to said central system, the improvement wherein said terminal comprises:

first indicator means comprising latch means and means responsive to the accepting means in the terminal to set said latch means by and upon the acceptance of data by said accepting means, said indicator means comprising first sensible means connected to said latch means to be operated upon and for the duration of the set condition of said latch means to indicate to a user of the terminal that the data has been accepted by the terminal,

means in the terminal operative to activate a connection of the terminal to said central system for said transmission thereto and to receive a data response signal from the central system,

and second indicator means in the terminal responsive to said connection and active by and upon receipt of said



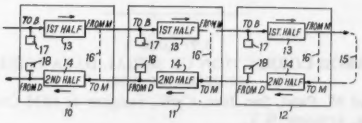
data response signal from said central system to reset said latch means, said second indicator means comprising a second sensible means operative to provide an indicator signal distinguishable from that of said first sensible means and operable by and upon said receipt of said response signal by the central system.

3,913,072

DIGITAL INTEGRATED CIRCUITS

Ivor Catt, Crouch Hall, Redbourn, Hertfordshire, England

Filed July 23, 1973, Ser. No. 381,686
Claims priority, application United Kingdom, Aug. 3, 1972, 36365/72
Int. Cl.² G06F *1/00*
U.S. Cl. 340—172.5 **25 Claims**



1. A digital integrated circuit comprising a plurality of undiced regions in a semi-conductor wafer, each region having at least one set of input connections and a plurality of sets of output connections and having formed thereon a digital circuit means for operating on digital information and for transferring digital information signals and control signals, said digital circuit including a logical switching circuit, said logical switching circuit including means for coupling a set of input connections to a selected one of the sets of output connections by way of said digital circuit, the sets of output connections being connected to sets of input connections of a plurality of neighbouring regions, and the logical switching circuit of each region including means responsive to certain of the control signals for changing the selected set of output connections.

3,913,073

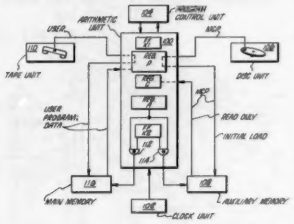
MULTI-MEMORY COMPUTER SYSTEM

Leonard Palmer, Concord, Calif., and Michael M. Tyler, Bellville, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 31, 1973, Ser. No. 365,748
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **8 Claims**

1. In a stored program computer system including an arithmetic unit including a number of arithmetic networks for operating in an execute mode or a control mode:

a counter unit for delineating word periods;
a control flip-flop for assuming various states during each word period;
a program counter unit for holding a count to activate various arithmetic networks during each word period; said count being determined by the state of said control flip-flop at the end of each prior word period;
an auxiliary memory for storing a master control program;
a main memory for storing a user program and data;
means for producing a control mode signal and an execute mode signal for the state of said program counter unit and

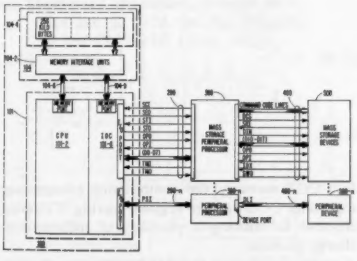


control flip-flop, said control mode signal indicating that said master control program is to be accessed and said execute mode signal indicating that said main memory is to be accessed;
means for storing said signals and maintaining said signals despite changes in state of said control flip-flop; and
gate means for effecting transfer of instructions of said master control program to said arithmetic unit in response to said first signal and for effecting transfer of information from said main memory to said arithmetic unit in response to said second signal.

3,913,074
SEARCH PROCESSING APPARATUS

John A. Homberg, Framingham, Mass.; Albert T. McLaughlin, Hudson, N.H.; John J. Melus, Wellesley, Mass.; Edwin J. Pinheiro, Edina, Minn.; John A. Recks, Chelmsford, and George Rittenburg, Waltham, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 18, 1973, Ser. No. 425,763
Int. Cl.[2] G06F *3/00, 15/20, 13/00, 9/16*
U.S. Cl. 340—172.5 **34 Claims**



1. An improved search system including at least a rotating storage device for facilitating the retrieval of records positioned successively along a plurality of concentric storage tracks of a magnetic surface of said device, each record including at least a key argument field portion and a data field portion, said system being operative to initiate a search for a data record identified by key argument byte signals transmitted by an input/output system as part of a command to said search system, said system further including a microprogrammed peripheral processing unit coupled to said device, said microprogrammed peripheral processing unit comprising:
microprogram processor control means, said control means including an addressable control store having a plurality of storage locations for storing a plurality of microinstructions and decoding means coupled to said control store for generating control signals in response to said microinstructions read out from said storage locations;
addressable read/write storage means coupled to said processor control means and operatively coupled to said input/output system, said storage means including a plurality of storage locations for storing information used in processing commands from said input/output system when conditioned by said processor control means;
data transfer means coupled to said read/write storage means and to said device, said data transfer means being operative to transfer signals between said read/write storage means and to said device;
arithmetic and logic means coupled to said microprogram control means and to said read/write storage means, said arithmetic and logic means including first and second input means and being operative to perform arithmetic and logical operations upon signals applied to said first and second input means;
said microprogram control means including first means operative in response to command signals from said input/output system specifying a predetermined type of search operation to condition said decoding means to generate control signals for conditioning said read/write storage means to store concurrently sets of byte signal representations of first and second groups of key argument signals from said data transfer means as applied to said first and second input means respectively from said input/output system and from said storage device read as a portion of a first data record encountered as one of said plurality of tracks, and
said microprogram control decoding means including means operative to generate control signals to condition said arithmetic and logic means to compare said sets of said byte signals and provide signals indicating the results of said compare operation; and,
said first means of said microprogram processor control means including means operative upon completing the processing of said first record in response to said signals from said arithmetic and logic means indicative of unsuccessful compare operation to condition said decoding means to generate control signals to condition said read/write storage means to store thereafter only second groups of byte signals received from said data transfer means corresponding to key argument field portions of data records successively read from said one track and to read out concurrently therewith said first groups of previously stored signals for comparison by said arithmetic and logic means against each one of said second groups until the identified record is located.

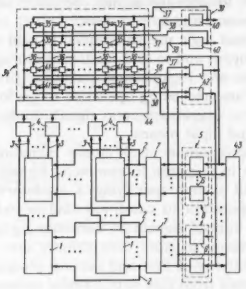
3,913,075
ASSOCIATIVE MEMORY

Georgy Viktorovich Vitaliev, ulitsa Vavilova 39, kv. 17, Moscow; Alexei Davidovich Gvinepadze, Ljubertsy, ulitsa Molodezhnaya 10, kv. 17, Moskovskaya oblast; Anastasia Adrianovna Koltsova, ulitsa Profsojuznaya 36/9, kv. 26, and Rem Vasilievich Smirnov, Teply stan, mikroraion 3, korpus 32, kv. 36, both of Moscow, all of U.S.S.R.

Filed Nov. 19, 1973, Ser. No. 416,941
Int. Cl. G11c *15/00, 7/00*
U.S. Cl. 340—173 AM **19 Claims**

1. An associative memory for performing search and logical operations on attributive information presented as multi-digit binary associative words or sets of a plurality of binary associative indications comprising: address memory modules arranged in a matrix for storing binary data; address and digit buses of said address memory modules for recording and

selecting the data stored in said address memory modules; memory elements in said address memory modules interconnected to said address and digit buses; detectors for detecting the location of data with given sets of binary associative indications, the inputs of said detectors being coupled electrically to said respective digit buses of said address memory modules; an interrogation register for storing a given set of binary associative indications which is the interrogation code, and having flip-flops with inputs and outputs, the number of said flip-flops being equal to that of binary associative indications in the interrogation code, the outputs of said flip-flops in said interrogation register being coupled electrically to said address buses of said respective address memory modules; said detectors being coincidence circuits having a numbers of inputs



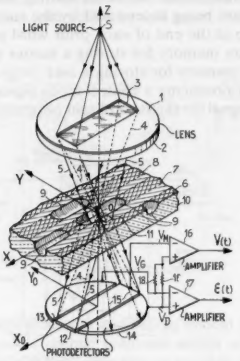
equal to that of said groups of said flip-flops in the interrogation register, and outputs of said detectors being electrically coupled to said inputs of said interrogation register; interrogation converters for converting the interrogation code from a binary position code into a code with a constant number of "1"s, the interrogation converters being provided with inputs and outputs, said inputs of each interrogation converter being coupled electrically to said outputs of a predetermined group of said flip-flops in said interrogation register and said outputs of each interrogation converter being connected electrically to said address buses of individual ones of said address memory modules, said interrogation converters being interrogation decoders converting a binary position code into a single excited-state code.

3,913,076
READING OUT AND TRACKING A RECORDED DIFFRACTIVE TRACE WITH AN ELONGATED READ OUT SPOT

Jean Claude Lehureau, and Claude Bricot, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Feb. 27, 1974, Ser. No. 446,503
Claims priority, application France, Mar. 2, 1973, 73.07542
Int. Cl.² G11C *13/04*; G11B *17/00*
U.S. Cl. 340—173 LT **9 Claims**

1. Optical system for reading-out a diffractive track of predetermined width forming at the surface of a record an embossed pattern constituted by successive diffracting elements, said optical system comprising: a source of radiant energy, illuminating means associated with said source for projecting onto said surface an elongated read-out spot, and photo-electric means arranged for receiving selected portions of the radiant energy emerging from the illuminated portion of said surface; said elongated read-out spot having a major axis at an angle with the longitudinal axis of said track for exploring said surface along a strip having a width greater than said predetermined width; said photo-electric means comprising a main photodetector, further photodetectors and electrical transmission means coupled to said photodetectors; said main photodetector receiving at least one portion of the zero order diffracted component contained in the radiation emerging from the illuminated portion of said surface; said further

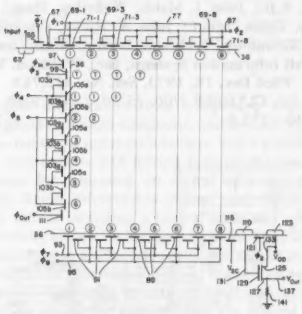


photodetectors being arranged outside the beam containing said zero order diffracted component for picking-up diffracted components of higher orders.

3,913,077
SERIAL-PARALLEL-SERIAL CCD MEMORY WITH INTERLACED STORAGE

Darrell M. Erb, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 17, 1974, Ser. No. 461,687
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **13 Claims**



1. In a CCD memory, the combination comprising:
a. a parallel CCD storage register having R channels, each channel for storing a plurality of information-bearing charge packets;
b. a serial CCD input register having one storage site for each of said R channels;
c. means for alternately clocking into said serial CCD input register charge packets to be stored in even and odd numbered ones of said R channels so that a first group of charge packets to be stored in even numbered channels are clocked into a first set of alternate storage sites in said serial CCD input register and a second group of charge packets to be stored in odd numbered channels are clocked into a second set of storage sites which alternate with said first set of storage sites; and

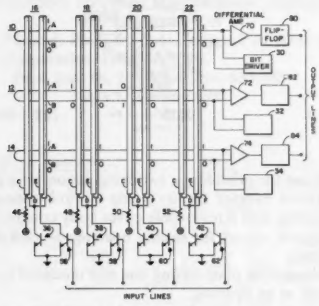
d. means for transferring into said R channels the charge packets previously clocked into said first and second sets of storage sites; and

e. means for concurrently stepping along said R channels the charge packets previously transferred thereto.

3,913,078
PLATED WIRE MATRIX SWITCH FOR SWITCHING DIGITAL DATA

William A. England, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 6, 1971, Ser. No. 104,222
Int. Cl.² G11C *11/155*
U.S. Cl. 340—174 PW **6 Claims**



6. The method of using a matrix of plated wires and orthogonal straps to selectively direct the passage of data wherein data present on a selected plurality of straps is additively induced in a selected plurality of wires, comprising the steps of:

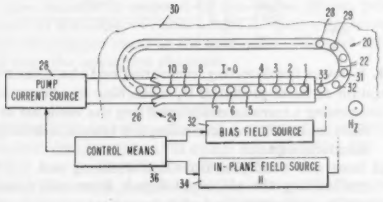
storing an unbalanced pattern of bits at the intersections of the selected plurality of wires and straps where additive induction of data present on the straps is desired; and,

storing a balanced pattern of bits at the intersections of the unselected plurality of wires and straps where additive induction of data present on the straps is not desired.

3,913,079
MAGNETIC BUBBLE DOMAIN PUMP SHIFT REGISTER

Laurence L. Rosier, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,602
Int. Cl.² G11C *11/14, 19/08*
U.S. Cl. 340—174 TF **30 Claims**



1. A propagation means for moving elements which have stray fields associated therewith, comprising:

means for confining said elements in a channel,

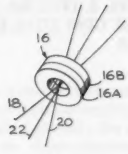
means for holding at least one of said elements in said channel in a substantially fixed position,

means for changing the size of elements in said channel while said at least one element is held in said substantially fixed position to cause interactions between elements in said channel which propagate said elements along said channel when said at least one element is released from its substantially fixed position.

3,913,080
MULTI-BIT CORE STORAGE

Donald C. Leo, Fountain Valley, and Donnie G. Hurley, Northridge, both of Calif., assignors to Electronic Memories & Magnetics Corporation, Los Angeles, Calif.

Continuation of Ser. No. 351,259, April 16, 1973, abandoned.
This application Nov. 29, 1974, Ser. No. 528,278
Int. Cl.² G11C *11/061;* **B28B** *11/00*
U.S. Cl. 340—174 ZB **9 Claims**



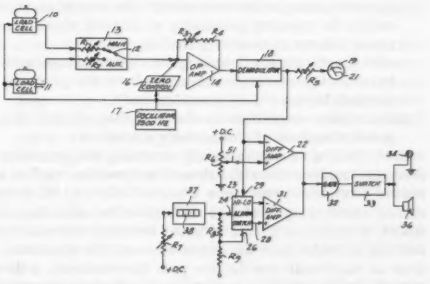
1. A multi-bit storage magnetic core comprising:

a unitary toroidal core made of a plurality of adherent contiguous layers of substantially rectangular hysteresis characteristic magnetic ferrite material, each layer having a coercive force which is different from the coercive force of all of the other layers, each layer having two states of magnetic remanence for representing two binary numbers, each layer at any given time having the property of being in one or the other of its two states of magnetic remanence independently of the state of magnetic remanence of any other layer whereby said core stores a plurality of separately identifiable binary numbers.

3,913,081
CRANE LOAD WARNING SYSTEM

Martin W. Hamilton, Arlington Heights, Ill., assignor to Eaton Corporation, Carol Stream, Ill.

Filed Oct. 23, 1973, Ser. No. 408,832
Int. Cl.² G08B *21/00*
U.S. Cl. 340—267 C **8 Claims**



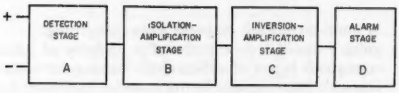
1. A load monitoring and warning device comprising, a load cell connected in circuit to produce an output signal proportional to the actual load on a crane, a differential amplifier with first and second input terminals and having an output terminal, a reference signal generator settable to obtain an output signal equal to the static output signal from said load cell, a voltage divider connected to said reference signal to produce a signal which is a percentage of said static output signal from said load cell, switch means having a first position

for connecting said output signal from said load cell to the first input terminal of said differential amplifier and said output signal from said reference signal generator to said second input terminal of said differential amplifier so that said output can be set to be equal to said output signal from said load cell, and said switch means movable to a second position to connect said output signal from said load cell to said second input terminal of said differential amplifier and to connect said voltage divider to said first input terminal of said differential amplifier.

3,913,082
IONIZATION AEROSOL DETECTOR

Jeffrey E. Hamm, Salt Lake City, Utah, assignor to Robert S. Jenson, North Vancouver, Canada, a part interest

Filed Feb. 2, 1973, Ser. No. 329,285
Int. Cl. G08b *17/10;* **H01j** *39/28*
U.S. Cl. 340—237 S **8 Claims**



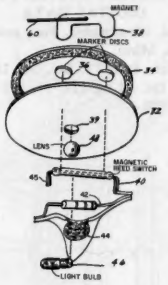
1. An ionization aerosol detection system comprising:
first and second electrodes spaced one from the other;
a DC voltage source maintaining a charge difference between the electrodes;
a radiation source situated between the electrodes and associated with the first electrode, the radiation source emitting particles into the space between the electrodes and the second electrode comprising a wire axially aligned iwht the radiation source;
means developing an electric field around the radiation source for focusing the emitted particles into a column generally along a line coaxial with the second electrode; means for exposing a quantity of ambient air to the focused column of emitted particles;
means for electrically detecting the change in conductivity between the electrodes resulting from the presence of aerosols between the electrodes; and
alarm means responsive to the detecting means when a preset threshold of conductivity is reached.

8. A method of electronically detecting the presence of aerosols in ambient air with a detection circuit having first and second electrodes spaced one from the other, a DC voltage source maintaining a charge difference between the electrodes, a radiation source situated between the electrodes emitting particles into the space between the electrodes to form an electrically conductive path therebetween, a detection chamber, at least a portion of which is electrically charged to the same polarity the predominant particle emitted by the radiation source, the method comprising the steps of:
developing an electric field around the radiation source for focusing the emitted particles into a column directed toward one electrode;
exposing the focused column of particles to a quantity of ambient air; and
electronically detecting changes in conductivity of the space between the electrodes due to the presence of aerosols with the ambient air.

3,913,083
CONTROL SYSTEM FOR AIRCRAFT REFUELING FACILITIES

George O. Baker, 8 Hillcrest Drive, Rochester, N.H. 03867

Filed Dec. 11, 1973, Ser. No. 423,876
Int. Cl.² G08B *21/00*
U.S. Cl. 340—252 R **9 Claims**

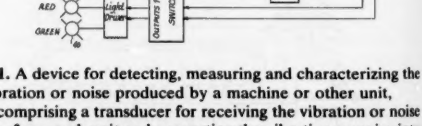


1. Means for providing a switching action for a petroleum-oil-lubricant hydrant facility pump control system having a junction box with a removable cover body containing hinged, nonmagnetic covers for sealing openings in said cover body comprising
a nonmagnetic plate having one side mounted to said cover body at an opening,
a magnetic reed switch mounted to said plate on the side of said plate remote from the cover body, and
means for providing a magnetic field proximate to said magnetic reed switch for its operation, said last-mentioned means being located on said one side of said plate.

3,913,084
NOISE QUALITY DETECTOR FOR ELECTRIC MOTORS OR OTHER MACHINES

John G. Bollinger, Madison, and Robert J. Sandberg, Verona, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 26, 1973, Ser. No. 345,186
Int. Cl. G08b *21/00*
U.S. Cl. 340—261 **4 Claims**



1. A device for detecting, measuring and characterizing the vibration or noise produced by a machine or other unit,
comprising a transducer for receiving the vibration or noise from such unit and converting the vibration or noise into electrical signals,
at least one band-pass filter for receiving and selectively transmitting the electrical signals from said transducer within a selected band of frequencies,
an indicating device for indicating excessive vibration or noise,
a peak detector for receiving the output signals from said filter and developing a peak detector output corresponding to the peak value of said output signals,
comparison means for actuating said indicating device if the input to said comparison means exceeds a predetermined level,

a first diode for supplying said peak detector output to the input of said comparison means,

an averaging detector for receiving the output signals from said filter and developing an averaging detector output corresponding to the average value of said output signals, and a second diode for supplying the averaging detector output to the input of said comparison means,

whereby said comparison means is responsive only to the larger of said peak detector output and said averaging detector output,

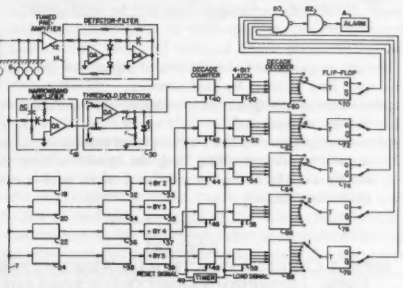
the larger of said outputs being effective to back bias the diode which would otherwise supply the smaller of said outputs.

3,913,085

MULTICHANNEL SYSTEM FOR SEISMIC SIGNATURE DETERMINATION

Arnold J. Farstad, Boulder, Colo., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1974, Ser. No. 433,955
Int. Cl.² G08B *13/00*
U.S. Cl. 340—261 **4 Claims**



1. A multi-channel signal processor for developing a signature of an earth disturbance in response to seismic signals, comprising, first means adapted to respond to seismic signals by developing a pulse output signal corresponding to the presence of a predetermined frequency component of said seismic signals, and a plurality of pulse repetition rate channels operatively connected to said first means, each of said channels including a narrow band amplifier to generate output signals in response to a different predetermined repetition rate of said output signals developed by said first means and an analog to digital converter means operatively connected to the output of said narrow band amplifier to convert the output signals of said narrow band amplifier to digital pulses and processor means operatively connected to said pulse repetition rate channels to respond to the digital output pulses produced by the respective channels to develop a signature of an earth disturbance based on the distribution of digital output pulses from the respective channels.

3,913,086

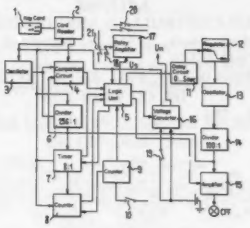
SYSTEM FOR SAFEGUARDING A DEVICE AGAINST BEING OPERATED AND USED BY PERSONS OF REDUCED CAPACITY

Karl Adler, Grenchen, and Georges Ducommun, Feldbrunnen, both of Switzerland, assignors to Bivistor S.A., Grenchen, Switzerland

Filed Oct. 4, 1973, Ser. No. 403,657
Claims priority, application Switzerland, Oct. 31, 1972, 15843/72
Int. Cl.² B60K *27/08*; B60T *7/14*; B60Q *1/00*; G08B *21/00*
U.S. Cl. 340—279 **10 Claims**

1. A method of safeguarding a device from being operated and used by persons of reduced capacity, whereby a person by correctly carrying out a capacity test on an automatic safety system coupled to the device cancels an inhibiting network of the device, the method comprising the steps of:

preceding a key in accordance with the personal normal capacity of the holder of the key;



inserting the key into a reader to program the automatic safety system to the personal characteristics of the key holder; testing the muscular motive functions, the reaction ability, the memory potential and the physio-psychic state of the key holder; and

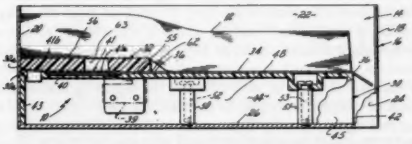
comparing the test results to the characteristics programmed into the automatic safety system to determine the state of the inhibited network.

3,913,087

DOCUMENT REMOVAL AND REINSERTION DETECTOR

John E. McBrian, Bethel, Conn., assignor to The Mosler Safe Company, Hamilton, Ohio

Filed Jan. 6, 1975, Ser. No. 539,043
Int. Cl.² G08B *21/00*
U.S. Cl. 340—280 **9 Claims**



1. A currency removal and reinsertion detector comprising:

a base having a currency supporting surface,

a cover overlying said base and having a currency restraining surface, said cover being fixedly secured relative to said base with said currency restraining and currency supporting surfaces in closely spaced confronting relation establishing a currency receiving slot into which currency can be inserted for placement between said surfaces,

a ferromagnetic element having a mounting section and a telltale section, said mounting section being mounted relative to said base and cover to position said telltale section inaccessibly within said slot for movement therein alternatively between upper and lower positions overlying and underlying, respectively, currency inserted in said slot,

said cover being provided with a viewing window therein overlying said telltale section to permit visual inspection of the position, upper or lower, of said telltale section relative to currency inserted in said slot, and

a magnet for moving said telltale section to its upper position to permit currency inserted in said slot to underlie said telltale section, said telltale section returning to its lower position upon removal from said slot of currency initially underlying said telltale, whereby reinsertion of said currency initially underlying said telltale without concurrent attraction thereof by said magnet will place

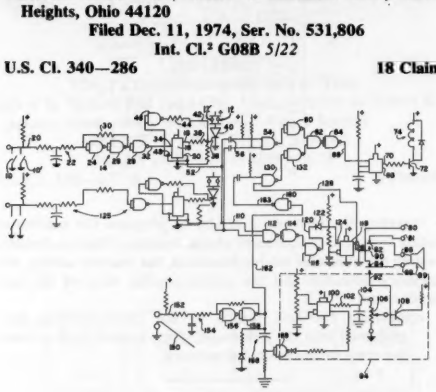
said reinserted currency overlying said telltale section and obscure it from view through said window, thereby providing a visual indication that currency initially inserted in said slot concurrent with magnetic attraction of said telltale section has been removed and reinserted.

3,913,088

FLIP FLOP CONTROLLED ANNUCIATOR SYSTEM

Lawrence Mark Sears, 25555 N. Moreland Blvd., Shaker Heights, Ohio 44120

Filed Dec. 11, 1974, Ser. No. 531,806
Int. Cl.² G08B 5/22
U.S. Cl. 340—286 **18 Claims**



1. An annunciator system comprising a plurality of signaling stations, a plurality of first switch means one of which is located at each of said plurality of signaling stations and each of which is operable to initiate and terminate a first signal at any of said plurality of signaling stations, a plurality of first indicating means one of which is located at each of said plurality of signaling stations and each of which is operable to indicate the establishment of said first signal, a plurality of second switch means one of which is located at each of said plurality of signaling stations and each of which is operable to initiate and terminate a second signal at any of said plurality of signaling stations, a plurality of second indicating means, one of which is located at each of said plurality of signaling stations, and each of which is operable to indicate the establishment of said second signal, first flip-flop means interconnecting said plurality of first switch means and said plurality of first indicating means to enable said first indicating means to be initiated and terminated at any of said plurality of signaling stations and to be indicated at all of said plurality of signaling stations and second flip-flop means interconnecting said plurality of second switch means and said plurality of second indicating means to enable said second signal to be initiated and terminated at any of said plurality of signaling stations and to be indicated at all of said plurality of signaling stations.

3,913,089

METHOD AND APPARATUS FOR GENERATING A TRAVELING DISPLAY

Francis E. Albrecht, Shelton, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

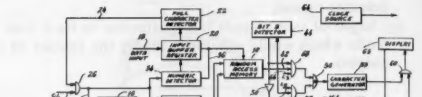
Filed July 27, 1973, Ser. No. 383,257
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 AD **16 Claims**

1. In a cyclically refreshed display device of the type which generates a plurality of writing strokes for each display line, information characters being displayed by selectively changing the visible state of M bits on each of N strokes for each character, a circuit for causing the display to travel in fractional stroke increments, comprising:

a first counter, each unit increment of which corresponds to a predetermined fractional stroke increment of the display;

a second counter, each unit increment of which corresponds to a full stroke increment of the display, said second counter being connected to be incremented in response to an overflow from said first counter;

control means for determining the number of predetermined fractional stroke increments which the display is to be incremented and for producing a control signal manifesting such number;



means responsive to said control signal for incrementing said first counter by said number;

means for applying successive characters for display on said display device; and

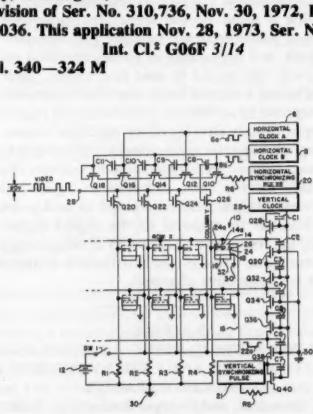
means responsive to the outputs from said first and second counters for controlling both the stroke and bit of said stroke at which display of the first of said successive characters begins.

3,913,090

DIRECT CURRENT ELECTROLUMINESCENT PANEL USING AMORPHOUS SEMICONDUCTORS FOR DIGITALLY ADDRESSING ALPHA-NUMERIC DISPLAYS

Albert G. Fischer, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 310,736, Nov. 30, 1972, Pat. No. 3,807,036. This application Nov. 28, 1973, Ser. No. 419,827
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **7 Claims**



1. An electroluminescent display panel comprising:

a light translucent substrate;

a transparent electrically conductive layer contiguous with one side of said substrate;

a layer of electroluminescent material contiguous with said transparent electrically conductive layer;

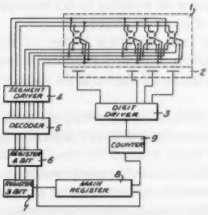
a plurality of metallized front electrodes and front islands with said front electrodes contiguous with said layer of

electroluminescent material, said front electrodes and said front islands insulated from each other;
a plurality of column leads connected to said plurality of front islands;
a layer of vitreous material contiguous with said plurality of metallized front electrodes and front islands and said layer of electroluminescent material;
a plurality of metallized rear electrodes and rear islands contiguous with said layer of vitreous material;
a plurality of row leads connected to said plurality of rear islands;
a positive direct current power supply, said power supply connected to said plurality of metallized rear electrodes for establishing a voltage differential across said layers of vitreous material and electroluminescent material such that the voltages differential between said rear and front metallized electrodes is close to the breakdown voltage of said layer of vitreous material;
a bucket brigade column shift register having two horizontal clock pulse circuits and horizontal synchronizing circuit as inputs and a plurality of column shift register metallic oxide semiconductors as outputs;
a bucket brigade row shift register having a vertical clock pulse circuit and vertical synchronizing circuit as inputs and a plurality of row shift register metallic oxide semiconductors as outputs wherein said two horizontal clock pulse circuits and said vertical clock pulse circuit are adapted for receiving display information;
a video terminal;
a plurality of video metallic oxide semiconductors having a gate electrode, a drain electrode, and a source electrode wherein said video terminal is connected to said source terminal of the plurality of video metallic oxide semiconductors and wherein the outputs of said plurality of column shift register metallic oxide semiconductors is connected to said gate terminal of the video metallic oxide semiconductors for switching video invormation through the video metallic oxide semiconductors to the rear metal islands for breaking down said layers of vitreous material and electroluminescent material to provide a display on said electroluminescent material according to the input display information to said column and row shift registers.

3,913,091
THERMAL SENSITIVE PRINTING HEAD

Susumu Aizawa, Suwa; Yoshikiyo Futagawa, Okaya, and Takemasa Shindo, Shiojiri, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Japan

Filed Dec. 19, 1973, Ser. No. 426,375
Claims priority, application Japan, Dec. 19, 1972, 47-127442
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 R **11 Claims**

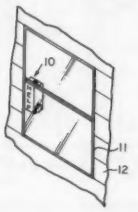


1. An exothermic printing head adapted to print on a thermally sensitive recording element, comprising a base plate formed from electrically high-resistance material, a plurality of exothermic elements disposed thereon, and circuit means coupled to said elements to apply pulse signals thereto corresponding to information to be printed the pulse width of each said pulse being insufficient to heat said exothermic elements to print on said heat sensitive medium, said base plate having a thermal conductivity less than 0.006 cal/cm.sec.°C and being adapted in response to the application of at least two pulses to said exothermic elements to accumulate sufficient heat to effect printing by said exothermic elements on a thermally sensitive recording element.

3,913,092
METHOD AND APPARATUS FOR TRANSMISSION OF CRITICAL INFORMATION FROM AN ILL PERSON

George R. Klingenberg, 615 S. Wright St., Tacoma, Wash. 98408

Filed Sept. 21, 1973, Ser. No. 399,406
Int. Cl.² G08B *13/08*
U.S. Cl. 340—332 **13 Claims**



1. A distress signal system for actuation by an ill person alone in a house for sending a call for assistance through a window to any one outside comprising,
a. housing means having a transparent front surface and an opaque rear surface for mounting in the window,
b. light circuit means in said housing means,
c. first attention calling means including a sign on said housing means front transparent surface for generating a flashing light when activated for attracting the attention of people outside of the house,
d. critical information card means in a card holder mounted on said housing means rear surface for supplying pertinent critical information about the likely diagnosis or disability of the ill person alone in the house who may need help,
e. second attention calling means on said housing means rear surface for attracting attention to said critical information card means,
f. switch means for said housing means for being activated by the ill person,
g. timing means for indicating lapse time from the moment of activation of the switch by the ill person, and
h. said switch means being responsive to the person desiring immediate help for being operated for,
1. actuating said first attention calling sign means for attracting attention of people outside of the house,
2. actuating said second attention calling means for attracting attention of people who have come inside the house to said critical information card means for supplying the likely diagnosis or disability of the ill person, identification of his doctor, location of medication, and
3. activating said timing means for indicating the lapse time since the ill person first actuated said switch.

3,913,093
METHOD OF AND MEANS FOR TRANSCODING BINARY PULSES

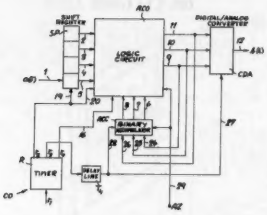
Girolamo De Vincentiis; Renato Dogliotti, and Angelo Luvison, all of Turin, Italy, assignors to SCELT Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Filed Mar. 4, 1974, Ser. No. 447,783
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **10 Claims**

1. A method of converting a sequence of bits into a generally balanced multilevel output signal, comprising the steps of: dividing said sequence into groups of four bits each;

assigning to each possible 4-bit combination a character in each of several alphabets, any character of each alphabet representing a pair of voltage levels selected from a set of seven discrete voltage levels ranging in integral steps from a positive limit +3 through zero to a negative limit −3, the algebraic sums of the voltage levels of any character in one of said alphabets being all either zero or of a first polarity, the algebraic sums of the voltage levels of any character in another of said alphabets being all either zero or of a second polarity;

generating a bipolar output signal whose voltage varies in accordance with the voltage levels represented by characters in a selected alphabet assigned to successive 4-bit



groups in a bit sequence to be converted, starting with a character from said one of said alphabets;

determining a mean voltage of the previously generated portion of said output signal; and

selecting characters from said one of said alphabets upon said voltage lying in a near-zero range with a relatively low maximum voltage of said first polarity but selecting characters from said other of said alphabets upon said mean voltage lying in an off-zero range with a relatively high maximum voltage of said first polarity, said algebraic sums being so chosen as to tend to maintain said mean voltage in said near-zero range.

3,913,094

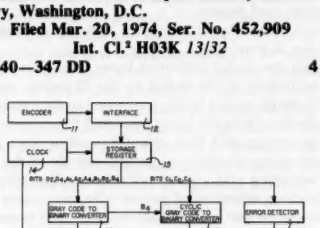
COUNT SEQUENCE TEST SET FOR A DISC TYPE DIGITAL ENCODER

William F. Wootton, III, Bloomington, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1974, Ser. No. 452,909

Int. Cl.² H03K *13/32*

U.S. Cl. 340—347 DD **4 Claims**



1. A device for checking a disc-type digital encoder which provides gray code outputs and cyclic gray code outputs corresponding to positions of a shaft of said encoder comprising, a first converter for converting a gray code to a first binary code,

a second converter for converting a cyclic gray code to a second binary code,

means for multiplying said first binary code by a factor of ten,

adder means for adding said first binary code multiplied by a factor of ten and said second binary code,

means connected to the output of said adder means for comparing an output against a previous output including an error detector connected to the output of said adder means for checking for a change in binary count of ±1, ±9, ±11, and ± full count, and

an alarm circuit connected to said error detector for providing a signal when said error detector detects a change other than ±1, ±9, ±11 and ± full count,

whereby any change other than ±1, ±9, ±11 or ± full count indicates an output error in a disc type digital encoder being checked.

3,913,095

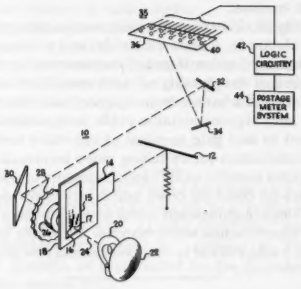
PHOTODETECTOR COMPENSATING CIRCUIT FOR A POSTAGE METERING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed July 19, 1973, Ser. No. 380,842

Int. Cl.² G08C *9/06*

U.S. Cl. 340—347 P **10 Claims**



1. A scale system having a photoelectric encoder for generating a code representing a weight on a scale, comprising, in combination:

A. an encoder in the form of a reticle having opaque and transparent areas forming at least one track and representing a predetermined code in accordance with a predetermined range of weights,

B. a scale for measuring said predetermined range of weights,

C. means for coupling said reticle to said scale such that said reticle moves a predetermined amount in accordance with the range of weights to be measured on said scale,

D. an array of photodetectors,

E. means for projecting an image of said reticle on said array of photodetectors whereby said photodetectors generate a code in accordance with the weight on said scale,

F. a compensation circuit coupled to a first one of said photodetectors in said array, which said first photodetector of said array is used for reading a least significant bit in said code, said compensation circuit having a dynamic biasing means for compensating said first photodetector, said dynamic biasing means comprising a second photodetector independent of said code generating photodetector array, which said second photodetector has substantially the same operating characteristics as said first photodetector of said array and which varies in accordance with undesirable light intensity and temperature variations, said second independent photodetector used solely for compensating said first photodetector of said

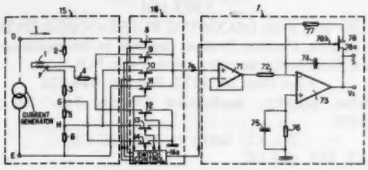
array for said undesirable light and temperature variations; and

G. means for controlling the intensity of light applied to said second independent photodetector.

3,913,096
MEASURING DEVICE FOR USE WITH AN ELECTRICAL TRANSDUCER HAVING PARABOLIC RESISTANCE RESPONSE

Agnes Veszi, Rueil-Malmaison, France, assignor to La Telemecanique Electrique, Nanterre, France

Filed July 27, 1973, Ser. No. 383,398
Claims priority, application France, Aug. 2, 1972, 72.27970
Int. Cl.² G08C *13/00*; H03K *13/17*; G01K *7/24*
U.S. Cl. 340—347 NT **4 Claims**



1. An apparatus for measuring a physical quantity, said apparatus comprising : a transducer unit having a transducer element (1) with an electrical resistance varying, as a function of said physical quantity, in accordance with a parabolic law, said transducer element having first terminal with a first wire (2) connected thereto and second terminal (F) with second (3) and third (4) wires connected thereto, at least said first and second wires having substantially the same electrical resistance values; a constant current generator having a first terminal (D) connected to said first wire and a second terminal (E); an auxiliary resistor (5) connecting the second wire to the second terminal of the constant current generator; an analog-to-digital converter (7) having an input (7*a*) and providing a digital display of the measured physical quantity; and switching means (16) connecting the first, second and third wires and the auxiliary resistor to the input of the analog-to-ditial converter, whereby there are successively applied to the said input, a first voltage signal appearing across the second terminal (F) of the transducer element and the second terminal (E) of the constant current generator, a second voltage signal appearing across the first terminal (D) of the constant current generator and the second terminal (F) of the transducer element and a third voltage signal appearing across the auxiliary resistor, the analog-to-digital converter including means for forming the quotient of the difference between the first and second voltage signals by the third voltage signal and the said auxiliary resistor having a resistance value substantially equal to the resistance of the transducer element for a predetermined value of the said physical quantity.

3,913,097
SOUND SIMULATOR FOR MODEL STEAM ENGINE

Walter J. Schedler, 544 Wildwood Way, Santa Clara, Calif. 95050

Filed Sept. 3, 1974, Ser. No. 502,423
Int. Cl.² G08B *3/00*
U.S. Cl. 340—384 E **7 Claims**

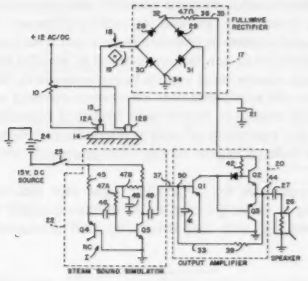
1. A sound generation system for a multi-wheeled model steam engine operating at a speed determined by the magnitude of electric power received from a controller, said system comprising:

an electronic circuit for generating a constant white noise signal representing a steam sound;

a switch electrically connected to receive electric power from the engine and including an actuator for turning the switch on momentarily at a rate responsive to the operating speed of the engine;

a full wave rectifier connected to receive electric current from the switch;

an amplifier having power terminals connected to receive electric power from the rectifier for providing an output signal responsive to the magnitude of the power received and synchronously with the closing of the switch, said amplifier also having signal input terminals connected to receive said white noise signal;



a capacitor connected across the power input terminals of the amplifier to filter and smooth out the power signal when any brief interruptions occur due primarily to the controller regulation and electrical connections between the engine and power source being momentarily broken;

a sound speaker connected to receive the amplifier output signal with such signal being the amplified white noise signal representing escaping steam occurring synchronously with the operating speed of the engine to simulate the actual sound of a steam engine.

3,913,098
LIGHT EMITTING FOUR LAYER DEVICE AND IMPROVED CIRCUITRY THEREOF

Tutomu Nakamura, Akashi; Saburo Matsuda, Nara, and Yoichi Ito, Osaka, all of Japan, assignors to Hayakawa Denki Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 883,770, Dec. 10, 1969. This application Mar. 23, 1973, Ser. No. 344,123
Claims priority, application Japan, Dec. 11, 1968, 43-90658; Jan. 18, 1969, 44-4311
Int. Cl.² G08B *3/00*
U.S. Cl. 340—384 E **10 Claims**

9. Apparatus for producing light and electrical pulses comprising a two terminal PNPN four-layer light emissive semiconductor element formed by a single epitaxial process exhibiting a forward voltage current characteristic including a current-controlled negative resistance region with a high impedance state and a low impedance state in the forward voltage area, said semiconductor element showing light emission at roon temperature at the high and low impedance states included in the negative resistance region in the forward voltage area wherein the intensity increases with the current flowing through said element in both the positive and negative regions of the forward voltage area, impedance means connected in

series with one terminal of said element, forward biasing means connected across said impedance means and said element in series to bias said element in the foroward voltage area, said biasing means and said impedance means being selected to provide a load line which intersects the voltage-current characteristic at only one point, said point being in said negative resistance region, capacitor means connected in shunt with said semiconductor element, said capacitor being alternately charged and discharged to concurrently provide a pulsating electrical current and a pulsating light output from said semiconductor element whereby said current and output may be selectively utilized to activate means responsive thereto, and second impedance means and a series connected light responsive switch interconnected in parallel with the first impedance means, said switch being responsive to light produced by said semiconductor element to connect said second impedance means in circuit with said first impedance means to shift the operation of said semiconductor element to the constant voltage region of the voltage-current characteristic thereof.

10. Apparatus for producing light and electrical pulses according to claim **9** including an electro-acoustic transducer interconnected with and driven by said semiconductor element.

3,913,099

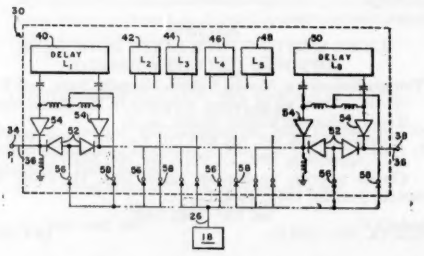
AUTOMATIC, DIGITALLY CONTROLLED RADAR TARGET MATCHED FILTER

Donald R. Wehner, San Diego; Michael J. Prickett, Santee, and Raymond B. Gylling, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1970, Ser. No. 49,376

Int. Cl.[2] G01S 9/06, 7/30

U.S. Cl. 343—5 SA **3 Claims**



1. A digital system for automatically identifying a remote radar target having a plurality of scatter centers comprising:

microwave energy means for illuminating said target with a high-range resolution RF pulse train;

receiver means for receiving reflected microwave energy from said target;

said reflected microwave energy comprising a range profile signature of said target and consisting of a plurality of discrete RF pulses,

each of said RF pulses corresponding to the energy reflected from one of said plurality of scatter centers of said target, and each of said RF pulses having a time-separation with respect to each other proportional to the physical separation of said scatter centers of said target;

matched filter means connected to said receiver means,

said filter means comprising a plurality of variable, microwave delay channels, and further including

power divider means for coupling each of said discrete RF pulses to a different one of said delay channels,

each of said delay channels comprising a bank of delay lines, each of said delay lines having a fixed delay and further including digital switch means associated with each of said delay lines;

a source of digital control signals connected to said filter means,

means for applying digital control signals from said source to energize selectively predetermined ones of said switch means to thereby connect in series the corresponding delay lines whereby in each channel a total delay is obtained which is substantially equal to the sum of the serially connected delay lines in that channel;

each of said discrete RF pulses being delayed in its corresponding delay channel an amount substantially equal to said time-separation between said RF pulses; and

means for coherently combining said time-delayed RF pulses to obtain an output waveform having an amplitude substantially equal to the sum of the amplitudes of the several discrete RF pulses.

3,913,100

DEVICE FOR DECODING PULSE-CODED DATA

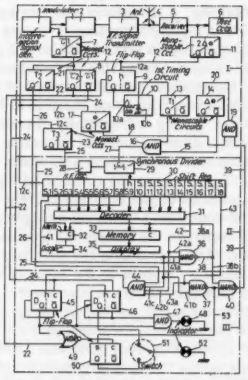
Albert Janex, Cachan, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,528

Claims priority, application France, Feb. 22, 1972, 72.45920

Int. Cl.[2] G01S 9/56; H03K 9/04

U.S. Cl. 343—6.5 LC **9 Claims**



1. A device for decoding pulse sequences of $(n-1)$ logic conditions each 0 or 1 spaced by one clock period θ, thereby determining 2^{n-1} normal codes, in which said sequence is marked by an initial pulse $F_1{}^o$, and which is arranged to recognize a pulse delayed $S\theta \pm \Delta\theta$ from said $F_1{}^o$ pulse, where $\Delta\theta$ is a time displacement tolerance, comprising the combination of:

a first timing circuit having a time constant $2\Delta\theta$ responsive to said sequence to be triggered by each pulse thereof including, initially, said $F_1{}^o$ pulse;

a shift register having at least n stages, the input of which is responsive to the $2\Delta\theta$ width pulse output of said first timing circuit;

a clock for generating timing pulses having a period θ connected to advance said shift register one stage each θ period, said clock including a pulse generator operating at a frequency (k/θ) and a divider-by-k circuit responsive to said pulse generator, said divider having an enable input and said K being an integer much greater than $(1/2\Delta)$;

a second timing circuit having a time constant $\Delta\theta$, responsive to the output of said first timing circuit;

a third timing circuit having a time constant T, responsive to the output of said second timing circuit, said third

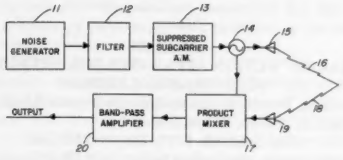
timing circuit being connected to said divider enable input to synchronize said clock for time T, from pulse $F_1°$ delayed by $\Delta\theta$, said T, being a time substantially longer than the longest of said sequence anticipated;

and a decoder coupled to $n-1$ adjacent shift register outputs in parallel, at time $(n+1)\theta$ after said $F_1°$ pulse, conditions 0 and 1 along said register outputs representing said word to be decoded.

3,913,101
SUB-CARRIER PROXIMITY FUZE SYSTEM

Donald J. Adrian, Arlington, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1958, Ser. No. 780,639
Int. Cl.² G01S 9/39
U.S. Cl. 343—7 PF **6 Claims**

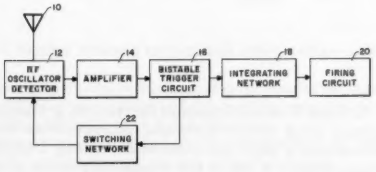


1. An AM fuze system comprising means for transmitting a signal having a carrier amplitude modulated by a noise modulated sideband signal, means for mixing said transmitted signal with a return echo signal from a target and means for deriving an output to actuate a fuze from the output of said mixing means.

3,913,102
BISTABLE FREQUENCY FUZE SYSTEM FOR VT FUZE

Richard C. Robinson, Whittier, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1963, Ser. No. 289,760
Int. Cl.² F42C 13/04
U.S. Cl. 343—7 PF **6 Claims**



1. In a bistable frequency fuze system for variable time fuzes, the combination comprising:

a. a radio frequency oscillator detector for producing output signals in response to received signals appearing as signals reflected from a target,

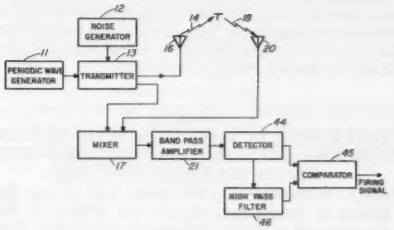
b. a bistable trigger circuit being coupled to said oscillator detector for producing first and second output voltages in response to output signals from said oscillator-detector,

c. switching network circuit means coupled to said bistable trigger circuit and to said oscillator detector and being responsive said first voltage to cause said oscillator to operate at a first frequency and to said second voltage to cause said oscillator to operate at a second frequency.

3,913,103
DEVICE FOR RANGE CUT-OFF BY FREQUENCY SELECTION IN MULTIPLE MODULATION FUZES

Carlton H. Cash, Norco, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1959, Ser. No. 789,459
Int. Cl.² G01S 9/39
U.S. Cl. 343—7 PF **3 Claims**

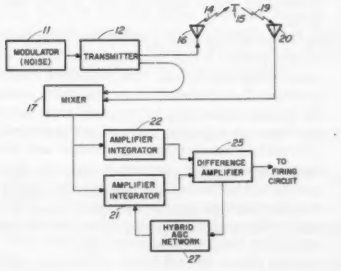


1. A radio fuze system comprising means for providing a signal frequency modulated by at least two separate frequencies, means for transmitting said signal, means for receiving a return signal from a target, a mixing circuit having first and second inputs coupled to said transmitting and receiving means respectively for producing an output signal comprising a spectrum of coherent Doppler wave portion plus an incoherent wave portion due to range noise, and spectral comparison circuit means coupled to the output of said mixing circuit for producing an output signal in response to the output signal of said mixing circuit when the energy level of the coherent Doppler wave portion of said output signal is of a predetermined amount greater than the incoherent portion of said output signal.

3,913,104
INCOHERENT SPECTRAL COMPARISON FUZE SYSTEM WITH HYBRID AGC

Donald J. Adrian, Arlington, and Carlton H. Cash, Norco, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1959, Ser. No. 793,936
Int. Cl.² G01S 9/24
U.S. Cl. 343—7 PF **2 Claims**



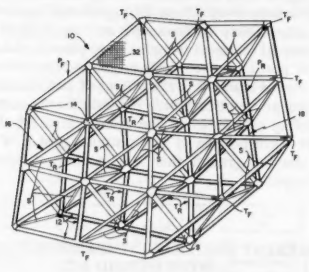
2. An FM fuze system comprising a source of band limited noise, an RF transmitter coupled to a source of band limited noise for transmitting a random noise modulated signal in the direction of a target, receiving means for receiving a return echo of said transmitted signal, a mixer circuit having a first and second input coupled to said transmitter and to said receiving means for producing an output signal containing co-

herent and incoherent signals, first amplifier intergrator circuit means coupled to said mixer circuit means for accepting a first band of frequencies within said incoherent portion of said mixer output signal and producing an output voltage proportional to the average amplitude of said first band of frequencies, second amplifier intergrator circuit means coupled to said mixer circuit for accepting a second band of frequencies within said incoherent portion of said mixer output signal and producing an output voltage proportional to the average amplitude of said second band of frequencies, difference amplifier means coupled to said first and second circuit means for producing an output signal proportional to the difference of the amplitudes of the output signals of said first and second amplifier integrator circuits.

3,913,105
COLLAPSIBLE SELF-ERECTING TUBULAR FRAME STRUCTURE AND DEPLOYABLE ELECTROMAGNETIC REFLECTOR EMBODYING SAME

Clyde E. Williamson; Roy M. Acker, both of Los Angeles; Gilbert A. Greenbaum, Encino, and William J. Phillips, Gardena, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 131,218, April 5, 1971, abandoned. This application May 23, 1973, Ser. No. 363,220
Int. Cl. E04h *12/18*
U.S. Cl. 343—840 **1 Claim**



1. A deployable antenna reflector for spacecraft and the like comprising:

a tetrahedral truss frame constructed of thin-walled, resilient, collapsible, strain energy erectile tubular frame members and having two spaced and generally parallel frame sections forming opposite sides of said frame and connecting struts between and joining said frame sections;

each frame section having a perimeter comprising a number of said tubular frame members joined end to end by first connecting means, and truss members each comprising a number of said tubular frame members joined end to end by second connecting means, said truss members extending between opposite sides of said perimeter in oblique intersecting relation to one another and being joined at their ends to said perimeter by said first connecting means and between their ends to one another at the truss member intersections by said second connecting means, and connecting struts comprising tubular frame members extending between and joined at their ends by said connecting means to said frame sections in such a way as to form with the tubular frame members of said frame sections a plurality of tetrahedral bays;

each said tubular frame member having a tubular portion and coplanar dimetrically opposed flanges along opposite sides of said tubular portion and the ends of the tubular portion of each frame member being flattened into coplanar relation with its flanges;

each said connecting means comprising a flat connecting plate located substantially in the plane of the corresponding frame section and seating the adjacent flattened frame member ends, each plate having an edge underlying the flattened end of and extending transverse to each of the corresponding frame members, and means joining the member ends to their respective connecting plates;

the outer side of one frame section conforming generally to an arcuate surface of selected contour, such as a parabolic surface;

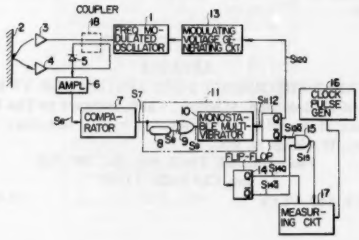
a flexible and foldable electrically conductive mesh secured to said outer side of said one frame section in a manner such that said mesh conforms generally to said surface contour to provide an electromagnetic reflecting surface when said truss frame occupies said tetrahedral truss configuration; and

said frame members being adapted to be flattened and folded and said mesh being adapted to be folded with said frame members to permit collapsing of said reflector to a compact storage configuration wherein said frame members store elastic strain energy for deploying said reflector when the collapsing force on the reflector is removed.

3,913,106
RADAR DETECTION APPARATUS FOR PREVENTING VEHICULAR COLLISIONS

Kazuo Sato, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,483
Claims priority, application Japan, June 18, 1973, 48-67854
Int. Cl.² G01S *9/24*
U.S. Cl. 343—9 **11 Claims**

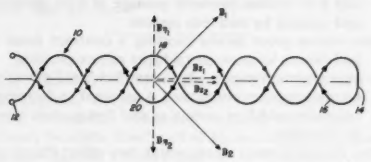


1. Radar detection apparatus for preventing vehicular collisions in which relative speed and relative distance between a vehicle and a target are determined utilizing Doppler signal characteristics in which two transmitting waves of different frequencies are employed, the relative speed and relative distance being determined by using the period of the Doppler signals and the phase difference between two generated Doppler signals, said apparatus comprising oscillator means capable of generating either of two signals of different frequencies at a time for transmission to the target, detector means for generating Doppler signals corresponding to each of said two frequencies, level sensing means connected to said detector means for sensing the level of the Doppler signals generated by said detector means, and control means for changing said oscillator means to transmit a signal having the other of said two frequencies when the level of said Doppler signal applied to said level sensing means crosses a predetermined voltage level.

3,913,107
NOISE CANCELLING MAGNETIC ANTENNA FOR USE WITH WATERCRAFT

Kerns H. Powers, Princeton, N.J., and Lewis L. Stetz, Jr., Levittown, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,582
Int. Cl.² H01Q 1/34
U.S. Cl. 343—709 **3 Claims**



1. An inductive-type antenna system for the transmission and reception of electromagnetic radiation in the extremely low frequency range comprising:

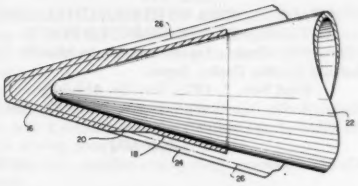
flexible core means; and

electrical conductor means wound coaxially around said core means along substantially the total length thereof and then wound coaxially around said core means back on itself in the same sense as the initial winding along substantially the total length of said core means to provide the second terminal to complete a circuit.

3,913,108
RADOME FORMED OF CURABLE BILLET AND WOUND TAPE

Kenneth E. Branen, Hudson, N.H., assignor to Avco Corporation, Cincinnati, Ohio

Filed July 19, 1974, Ser. No. 490,094
Int. Cl.² H01Q 1/42
U.S. Cl. 343—872 **4 Claims**



1. A radome having a substantially conical shape comprising:

a substantially hollow billet forming the apex of the radome, said billet having front and rear portions, said rear portion being defined by a reduced thickness;

a tape material wound to form the remainder of the radome overlapping the rear portion of the billet; and

the billet and the tape form a cured homogenous radome.

3,913,109
ANTENNA ERECTION MECHANISM

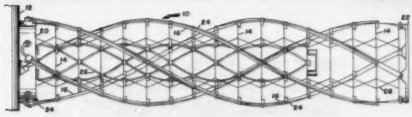
Charles F. Owen, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1974, Ser. No. 528,609
Int. Cl.² H01Q 1/08, 1/36
U.S. Cl. 343—880 **6 Claims**

1. A self-erecting boom comprising:

a plurality of mutually parallel annular supporting segments spaced apart from each other and aligned to define spatially a cylinder; and,

at least two flexible bands extending generally in a direction essentially parallel to the cylinder defined by the segments and winding helically about the cylindrically defined contour of the boom, the bands each being attached to the segments at the point of intersection of each band with the periphery of each of the segments,

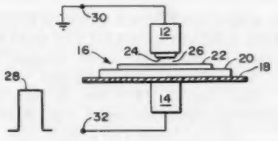


compression of the boom into a compact, non-deployed configuration storing energy in the bands, which energy is released on extension of the bands to erect the boom to a deployed configuration.

3,913,110
HIGH SPEED NON-IMPACT PRINTING

Robert W. Haeberle; Donald J. J. Lennon, both of Acton, and Harvey G. Schleifstein, Watertown, all of Mass., assignors to The Carter's Ink Company, Cambridge, Mass.

Continuation of Ser. No. 32,484, April 13, 1970, abandoned, which is a division of Ser. No. 693,965, Dec. 27, 1967, Pat. No. 3,550,153. This application Aug. 14, 1972, Ser. No. 280,460
Int. Cl. C09c 1/44; G03g 13/00
U.S. Cl. 346—139 **3 Claims**



1. A donor sheet for electrical pulse printing having a conductive high resistance self-supporting portion and a plurality of finely divided, electrically conductive uncharged mobile printing particles attached lightly to and dispersed over a first surface of said portion, said sheet having an electrical resistivity of at least 5×10^6 ohm-cm and having sufficient conductivity to conduct a current between said particles and the opposite surface of said self-supporting portion during the presence of an image shaped electrical field of short duration extending through said surfaces so that those particles located within said image shaped field accumulate charge of a sufficient magnitude and sign to cause them to detach from said donor sheet during the presence of said electrical field.

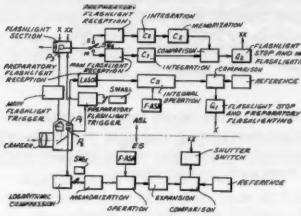
3,913,111
CAMERA HAVING AUTOMATIC FLASH AND SHUTTER CONTROLS

Seijiro Tokutomi, Fujisawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 29, 1974, Ser. No. 456,378
Claims priority, application Japan, Apr. 3, 1973, 48-38011
Int. Cl.² G03B 15/02
U.S. Cl. 354—127 **9 Claims**

1. In a camera, flash means for providing preparatory flash illumination prior to film exposure and main flash illumination during film exposure, preparatory circuit means electrically connected with said flash means for operating the latter to provide said preparatory flash illumination, main circuit means electrically connected with said flash means and with said preparatory circuit means for operating said flash means to provide said main flash illumination in a manner determined by the operation of said flash means during said prepar-

atory flash illumination, memory means for storing an electrical quantity corresponding to normal illumination, memory switch means electrically connected with said memory means for rendering the latter operative during one interval to store said electrical quantity, preparatory switch means electrically connected with said preparatory circuit means for rendering the latter operative during another interval, and control means operatively connected with said memory switch means and



said preparatory switch means for making said intervals occur at different at least partly non-overlapping times by respectively operating both of the latter switch means at different at least partly non-overlapping times to thereby permit said memory means to store an electrical quantity corresponding to normal illumination and prevent said memory means from storing an electrical quantity corresponding to said preparatory flash illumination.

3,913,112

SHUTTER AND VIEWFINDER MIRROR INTER-LINKAGE MEANS FOR A SMALL SINGLE-LENS REFLEX CAMERA

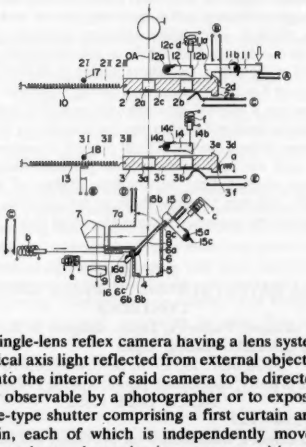
Sho Takahama, Nishinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 28, 1974, Ser. No. 501,390

Claims priority, application Japan, Aug. 28, 1973, 48-96939

Int. Cl.[2] G03B *19/12, 9/40, 9/38*

U.S. Cl. 354—156 **9 Claims**



1. In a single-lens reflex camera having a lens system along whose optical axis light reflected from external objects may be directed into the interior of said camera to be directed into a viewfinder observable by a photographer or to expose a film, a guillotine-type shutter comprising a first curtain and a second curtain, each of which is independently moveable, is normally urged to and remains in a repose position, wherein it permits passage of light directed into said camera by said lens system, and is moveable to and retainable in a cocked position, wherein it permits passage of said light, electronically controlled means which is actuated simultaneously with release of said first curtain from said cocked position and subsequently holds said second curtain in said cocked position for a time that is variable in accordance with ambient light conditions, and a pivotally mounted mirror, which is moveable to first mirror position wherein said mirror permits light directed into said camera by said lens system and passed by said shutter to reach and expose a film, and to a second mirror position wherein said mirror prevents said light from reaching a film and directs said light into said viewfinder, a shutter and mirror interlinkage means comprising

a first retention means which, subsequent to release of said first curtain from said cocked position, retains said first curtain in a first curtain intermediate position wherein said first curtain prevents passage of light directed into said camera by said lens system.

first mirror pivot means exerting a constant force urging said mirror to move to said first mirror position

mirror retention means which may hold said mirror in said second mirror position, and is actuated to disengage said mirror by said first curtain at said first curtain intermediate position

first disengagement means which may effect disengagement of said first retention means from said first curtain, whereby said first curtain may be moved from said first curtain intermediate position to said repose position, and permit commencement of a film exposure, and which is actuated by said mirror at said mirror first position

second retention means which, subsequent to release of said second curtain from said cocked position, retains said second curtain in a second curtain intermediate position wherein said second curtain prevents passage of light directed into said camera by said lens system, whereby a film exposure is terminated

second mirror pivot means which may move said mirror to said second mirror position, and is actuated by said second curtain at said second curtain intermediate position

second disengagement means which may effect disengagement of said second retention means from said second curtain, whereby said second curtain may be moved from said second curtain intermediate position to said repose position, and which is actuated by said mirror at said second mirror position.

3,913,113

COMPACT CAMERA WITH OBJECTIVE LENS SETTABLE TO PRE-SELECTED FOCUS

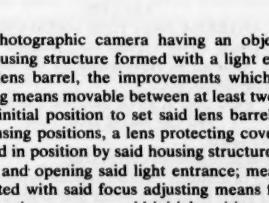
Maki Yamashita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1973, Ser. No. 412,243

Claims priority, application Japan, Nov. 22, 1972, 47-134968[U]

Int. Cl. G03b *3/02*

U.S. Cl. 354—195 **12 Claims**



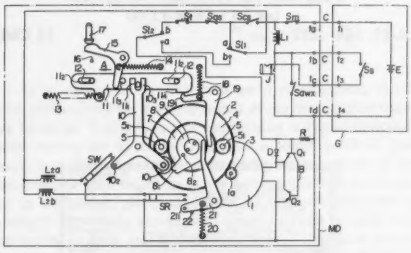
12. In a photographic camera having an objective lens barrel and housing structure formed with a light entrance in front of the lens barrel, the improvements which comprise focus adjusting means movable between at least two positions including an initial position to set said lens barrel to corresponding focusing positions, a lens protecting covering movably supported in position by said housing structure for selectively closing and opening said light entrance; means operatively connected with said focus adjusting means for biasing said focus adjusting means to said initial position; and means

operatively connected with said focus adjusting means for interlocking said focus adjusting means with said lens protecting covering, said interlocking means being capable of arresting said focus adjusting means at positions other than said initial position against said biasing means when said lens protecting covering is in position to open said light entrance, said interlocking means being actuated by said lens protecting covering to permit said focus adjusting means to return to said initial position from any other position by said biasing means when said lens protecting covering is moved to a position to close said light entrance.

3,913,114
ELECTRICAL DRIVING DEVICE FOR CAMERA

Tatsuya Taguchi, Tokyo; Yoji Sugiura, Yokohama; Hiroshi Aizawa, Machida; Masanori Uchidoi, Kawasaki, and Tomonori Iwashita, Chofy, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,450
Claims priority, application Japan, Feb. 1, 1973, 48-13431
Int. Cl.² G03B *17/42*
U.S. Cl. 354—204 **6 Claims**



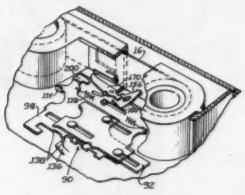
1. An electrical driving device for the camera in which the winding up operation for shutter charging and film winding up and the shutter release operation are carried out repeatedly comprising;

- a driving means,
- a driving rotary body connected with said driving means in such a manner that the rotation can be transmitted to the driving rotary body,
- at least one satellite rotary body pivoted on said rotary body,
- a solar rotary body for winding up operation connected with said satellite rotary body in such a manner that the rotation can be transmitted to said solar rotary body,
- a solar rotary body for shutter release connected with said satellite rotary body in such a manner that the rotation can be transmitted to said solar rotary body, said solar rotary body for shutter release being coaxial with said solar rotary body for the winding up operation but presenting a different number of the teeth from that of said solar rotary body for the winding up operation,
- binding means for controlling said solar rotary body for winding up in a certained determined position, said binding means being freed from controlling the determined position by the finishing of the winding up of said solar rotary body for the winding up operation,
- a release means connected with said binding means in such a manner that said release means can operate in response to said binding means,
- said release means presenting a lock means for locking said binding means, said lock means locking said binding means when the control of the determined position is freed, whereby the lock is released by the movement of said solar rotary body for shutter release.

3,913,115
FILM PERFORATION SENSOR

Arthur C. Mueller, Niles, and Mervin W. LaRue, Jr., Barrington, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,522
Int. Cl.² G03B *1/00*
U.S. Cl. 354—213 **12 Claims**



1. For a still camera having a built-in motor for driving on demand a transport mechanism for moving a film having a perforation proximate each film frame, a shutter operating means and a control system for accurately positioning the film repeatably according to the position of the perforation relative to an exposure aperture, the control system comprising

a perforation sensing assembly including:

perforation sensor means displaceable into and out of engagement with perforations in the film; and

multiplier means coupled to said sensor means to amplify the movement of said sensor means into and out of a perforation in the film;

circuit means for controlling energization of the motor;

contact means in said circuit means for selectively energizing and de-energizing said motor control circuit means responsive to displacement of said perforation sensing assembly into and out of perforations in the film; and

the shutter operating means being movable into and out of operative engagement with said perforation sensing assembly, said shutter operating means when moved into operative engagement with said perforation sensing assembly causing withdrawal of said sensor means from a perforation and causing initiation of motor energization through said contact in said circuit means

whereby said motor when energized causes transportation of a length of film until said sensor means senses presence of another perforation at a desired location and through said circuit means de-energizes said motor.

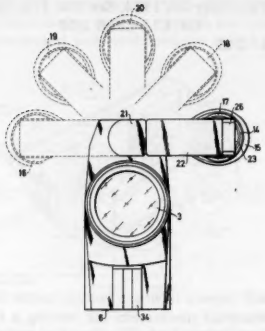
3,913,116
CAMERA WITH ADJUSTABLE VIEWFINDER

Erich Kastner, Munich, and Kurt Wallner, Dietersheim, both of Germany, assignors to Arnold & Richter KG, Munich, Germany

Continuation-in-part of Ser. No. 320,251, Jan. 2, 1973, abandoned. This application Jan. 17, 1974, Ser. No. 434,084
Claims priority, application Germany, Jan. 7, 1972, 2200690
Int. Cl. G03b *13/10*
U.S. Cl. 354—223 **8 Claims**

1. A photographic camera comprising: a camera housing; a lens mounted on said housing for receiving light from the subject being photographed and for directing such light to an associated photographic film, the light path from the subject to the film defining a shooting light path; a viewfinder comprising a light entry opening, a light exit opening and an intermediate light transmitting arm for receiving light from the subject being photographed and for directing such light to the eye of the photographer, the light path from the subject to the eye of the photographer defining a viewfinder light path; optical means for diverting the viewfinder light path from the shooting light path and for directing the viewfinder light out of the camera housing; a magnifying eyepiece pivotally

mounted on the arm of said viewfinder for defining said light exit opening in a direction facing away from the subject being photographed; and mounting means for rotatably mounting said arm and its associated eyepiece about an axis substantially parallel to a line between the lens and the subject being photographed for enabling said viewfinder to be pivoted between positions on the right and left sides of the camera housing.



3,913,117

FOCAL PLANE SHUTTER FOR PHOTOGRAPHIC CAMERA

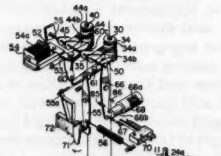
Takashi Endo, and Masaaki Morota, both of Tokyo, Japan, assignors to Yashica Co., Ltd., Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,745

Claims priority, application Japan, Nov. 13, 1973, 48-126807; Nov. 15, 1973, 48-131224; Mar. 5, 1974, 49-25283

Int. Cl.² G03B *9/34, 9/66*

U.S. Cl. 354—242 **5 Claims**



4. A focal plane shutter system for photographic camera comprising:

a. a first shutter curtain mechanism for driving a shutter curtain which is moved from a closed position to an opened position to cause the film to be exposed to light when the shutter is operated;

b. a second shutter curtain mechanism having a curtain winding shaft provided independently of the first shutter curtain mechanism and driving a shutter curtain which is moved from an opened position to a closed position to stop the film exposure when the shutter is operated;

c. a winding mechanism having a winding force transmission member provided with a portion to be engaged with the first and second shutter curtain mechanism during the course of the winding operation thereof and with another portion to be disengaged with the first and second shutter curtain mechanisms at the end of the winding operation,

d. a holding means for holding the first and second shutter curtain mechanisms at end positions of the winding operation;

e. a release means for controlling the holding means to operate the first and second shutter curtain mechanisms for the film exposure; and

f. a stopper means for stopping the first and second shutter curtain mechanisms at the end positions of operation, wherein ther stopper means comprises spiral grooves provided respectively on two winding shafts of the first and second curtain mechanisms and members which move upward or downward slidably contacting the spiral grooves when the winding shafts are rotated and which determines the end positions of the operation by abutting against ends of the spiral grooves when the first and second curtains are brought to the respective end positions of operation.

3,913,118

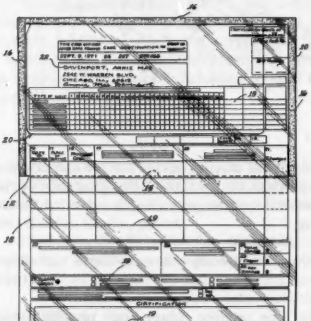
APPARATUS FOR PREPARING STATEMENTS

Richard N. Abrams, 2514 Farnsworth, Northbrook, Ill. 60062

Filed Aug. 10, 1973, Ser. No. 387,437

Int. Cl.² G03B *15/00*

U.S. Cl. 354—292 **12 Claims**



1. An apparatus for preparing a master information recording form adapted to be processed through a copying machine to produce an information recording document comprising:

a matrix composed of transparent material;

printed matter permanently affixed to one surface of said transparent material for providing a printed form describing said information recording document and providing at least one space which must be completed;

a second material adhered to said transparent material to form a pocket in said matrix at a location which completes said printed form;

said pocket adapted to receive a first information bearing form juxtaposed over said printed form.

3,913,119
APPARATUS FOR WET TREATMENT OF WEBS OF PHOTOSENSITIVE MATERIAL

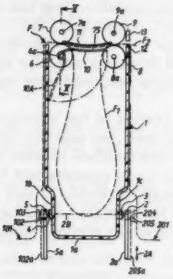
Josef Pfeifer, Unterhaching, and Wilfried Hofmann, Taufkirchen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 21, 1974, Ser. No. 516,414

Claims priority, application Germany, Oct. 25, 1973, 2353601

Int. Cl.² G03D *13/00*

U.S. Cl. 354—298 **20 Claims**



1. In an apparatus for wet treatment of elongated flexible webs, particularly for wet treatment of carriers of photosensitive material, a combination comprising a liquid-containing vessel having an upper portion and a lower portion; guide means including an upper section and a lower section, at least said lower section being movable between an operative position in which said sections define an elongated channel extending transversely across said upper portion of said vessel and having an inlet and an outlet, and an inoperative position in which said lower section permits a web in said channel to move generally downwardly toward said lower portion of said vessel; means for moving said lower section between said operative and inoperative positions; a first pair of rotary web advancing members adjacent to said inlet; a second pair of rotary web advancing members adjacent to said outlet; first drive means for rotating said first pair of advancing members so that a web whose leader is introduced between said first pair of advancing members is caused to advance through said channel and into the range of said second pair of advancing members; second drive means for intermittently rotating said second pair of advancing members; first detector means for monitoring the web downstream of said second pair of advancing members; means for arresting said second drive means and for actuating said moving means to effect a movement of said lower section to said inoperative position in response to detection of the leader of a web by said first detector means whereby, in response to continuing rotation of said first pair of advancing members, the web portion behind said leader descends in said vessel and forms a loop having a bight which moves towards the lower portion of said vessel; second detector means in the region of said lower portion of said vessel for monitoring the bight of said loop; and means for starting said second drive means in response to detection of the bight by said second detector means.

3,913,120
THIN FILM RESISTORS AND CONTACTS FOR CIRCUITRY

Syamal K. Lahiri, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

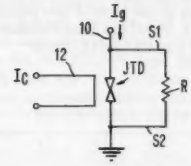
Filed Dec. 28, 1973, Ser. No. 429,461

Int. Cl. H01l *11/00*

U.S. Cl. 357—5 **12 Claims**

1. A Josephson tunnelling device circuit, comprising:

a Josephson tunnelling device having first and second electrodes with a tunnel barrier therebetween, said Josephson tunnelling device being characterized by the capability of supporting a zero voltage tunnel current therethrough,



at least one superconducting line connected to said Josephson tunnelling device, said superconducting line being electrically connected to a resistor wherein said resistor is comprised of a multi-component solid solution or intermetallic compound which is present as a stable phase in said superconductive line.

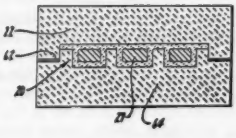
3,913,121
SEMICONDUCTOR STRUCTURE

Albert P. Youmans, Cupertino; David F. Allison, Los Altos, and David A. Maxwell, San Jose, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 391,704, Aug. 24, 1964, Pat. No. 3,829,889, which is a continuation-in-part of Ser. No. 338,802, Jan. 20, 1964, abandoned, which is a continuation-in-part of Ser. No. 330,697, Dec. 16, 1963, abandoned. This application Jan. 27, 1970, Ser. No. 6,078

Int. Cl. B44d *1/18*

U.S. Cl. 357—10 **7 Claims**



1. A semiconductor body comprising: a first layer of semiconductor material of a first conductivity type having an upper and a lower surface; a substantially planar second layer adjacent and adherent to the upper surface of said first layer, said second layer comprising a material that protects said upper surface from unwanted contamination; a third layer of supporting material adjacent and adherent to the exposed portion of said second layer, said third layer material capable of being easily removed by a substance that will not affect said second layer; a fourth layer adjacent and adherent to the lower surface of said first layer and formed to separate said first layer into a plurality of separate and distinct regions, said fourth layer comprising a material that provides electrical insulation along the adjacent first layer lower surface; a fifth layer adjacent and adherent to the exposed portion of said fourth layer and comprising a supporting material, whereby integrated circuits may readily be formed by removing said third layer of supporting material and processing the remaining portion of the wafer.

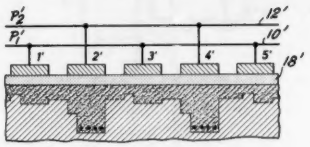
3,913,122
CHARGE-COUPLED DEVICE AND METHOD OF FABRICATION OF THE DEVICE

Joseph Borel, Echirolles; Jacques Lacour, Grenoble, and Gérard Merckel, La Tronche, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 217,595, Jan. 13, 1972, Pat. No. 3,829,884. This application Dec. 28, 1973, Ser. No. 429,149The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **3 Claims**



1. A charge-coupled device comprising, a doped semiconductor substrate coated with an insulating thin film carrying an assembly of conductive electrodes which are disposed in succession along one axis, means for creating a potential barrier for the minority carriers upstream, with respect to the direction of transfer of said carriers of a charge-storage region in approximately coincident relation with the region which is subjacent to one of the electrodes, means for injecting a predetermined charge of minority carriers beneath at least the first electrode, and means for establishing appropriate values of potential on each electrode and for modifying these values in cycles each of which causes the transfer of the carriers from each electrode to one of the adjacent electrodes whose potential barrier is located on the same side as the electrode from which the charge is derived, and a surface region for said substrate between the electrodes in which the presence of the donor or acceptor dopant is at least partially compensated by the presence of an acceptor or donor respectively.

3,913,123
BIPOLAR TYPE SEMICONDUCTOR INTEGRATED CIRCUIT

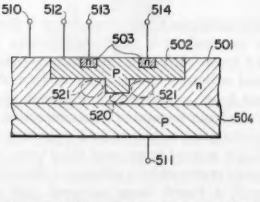
Akira Masaki, Kodaira; Masaharu Kubo, Hachioji, and Tsuneyo Chiba, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 27, 1973, Ser. No. 345,469

Claims priority, application Japan, Mar. 27, 1972, 47-29718

Int. Cl.² H01L *29/72*, *29/06*, *27/02*

U.S. Cl. 357—34 **9 Claims**



1. A bipolar type semiconductor integrated circuit for a negative logic circuit comprising:

a first semiconductor layer having a first conductivity type, having first and second principal surfaces, and constituting the base of a first transistor and the emitter of a second transistor;

a second semiconductor layer of a second conductivity type, opposite said first conductivity type, having first and second principal surfaces, said first principal surface of said second semiconductor layer being disposed upon the second principal surface of said first semiconductor layer, said second semiconductor layer constituting the emitter of said first transistor;

a first semiconductor region of said second conductivity type disposed in the first principal surface of said first semiconductor layer, and constituting the collector of said first transistor and the base of said second transistor;

at least two second semiconductor regions of said first conductivity type disposed in said first semiconductor region, which are separated from each other and constitute at least two collectors of said second transistor;

first and second terminals for supplying power, connected to said first semiconductor layer and to said second semiconductor layer, respectively; and

an input terminal and at least two output terminals connected to said first semiconductor region and to said at least two second semiconductor regions, respectively; and wherein

a first selected portion of the interface between said first semiconductor layer and said first semiconductor region is spaced from the interface between said first and second semiconductor layers opposite said first selected portion by a first prescribed portion of said first semiconductor layer which is less than the separation between said interfaces at the remaining portions thereof.

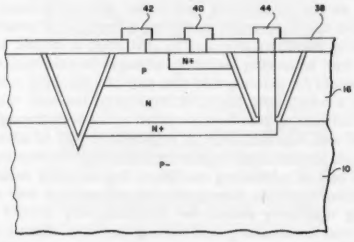
3,913,124
INTEGRATED SEMICONDUCTOR TRANSISTOR STRUCTURE WITH EPITAXIAL CONTACT TO THE BURIED SUB-COLLECTOR INCLUDING FABRICATION METHOD THEREFOR

Donald K. Roberson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 3, 1974, Ser. No. 430,434

Int. Cl.² H01L *27/02*

U.S. Cl. 357—40 **8 Claims**

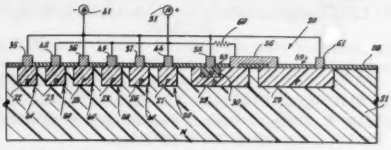


1. An integrated semiconductor structure comprising a body of semiconductor material having at least one semiconductor transistor device formed therein having an emitter region, a base region and a buried sub-collector region in said body of semiconductor material; a groove having sidewalls formed in said body of semiconductor material and surrounding said semiconductor transistor device; dielectric isolation means on the sidewalls of said groove for insulating said semiconductor transistor device from the remainder of said integrated semiconductor structure; polycrystalline semiconductor material in said groove; and a body of high conductivity monocrystalline semiconductor material of the same conductivity type as said buried sub-collector region extending through said groove within and contiguous with said polycrystalline semiconductor material said body of high conductivity monocrystalline semiconductor material passing through said dielectric isolation means to and to contact said buried sub-collector region.

3,913,125
NEGATIVE IMPEDANCE CONVERTER

William L. Geller, and Jeremiah P. McCarthy, both of Framingham, Mass., assignors to GTE Laboratories Inc., Waltham, Mass.

Division of Ser. No. 369,043, June 11, 1973. This application Oct. 23, 1974, Ser. No. 515,116
Int. Cl.² H01L 27/02, 29/66, 27/04
U.S. Cl. 357—46 5 Claims



4. A semiconductor circuit module for a negative impedance converter having input and output terminals, which comprises:

a. a semiconductor substrate of a first conductivity type;

b. a first transistor having a base of a first conductivity type which is said substrate, a first collector and an emitter of a second conductivity type in a first and second region formed by diffusion in said substrate and extending to the surface thereof, and a second collector of a second conductivity type in a third region formed by diffusion in said substrate and extending to the surface thereof;

c. a second transistor having a collector of the first conductivity type which is said substrate, a base of the second conductivity type which is said third region, an emitter of the first conductivity type, said emitter comprising a fourth diffused region formed within said third region and extending to the surface thereof;

d. first, second, third and fourth spaced electrodes conductively contacting said first, second, third and fourth regions respectively, said second electrode is coupled to said input terminal and said first electrode is coupled to said output terminal;

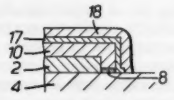
e. a resistor of a second conductivity type in a fifth region formed by diffusion in said substrate and extending to the surface thereof, and a fifth and sixth electrode conductively contacting on opposed sides of said fifth region, said fifth electrode being coupled to said third electrode; and

f. resistive means coupling said second and third electrodes.

3,913,126
SILICON DIOXIDE ETCH RATE CONTROL BY CONTROLLED ADDITIONS OF P_2O_5 AND B_2O_3

Colin Edwin Lambert Hooker, and Derek William Tomes, both of Swindon, England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Aug. 9, 1973, Ser. No. 387,055
Claims priority, application United Kingdom, Aug. 25, 1972, 39669/72
Int. Cl.² H01L 29/34
U.S. Cl. 357—52 7 Claims

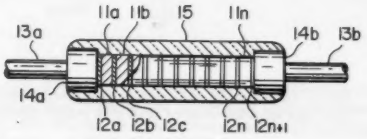


1. A process for the production of a transistor, which process includes the steps of pyrolytically depositing a silicon dioxide layer onto a semiconductor slice, and subsequently etching away silicon dioxide portions of the slice, said silicon dioxide layer consisting of from 10 to 25 per cent boron trioxide, from 10 to 30 per cent phosphorus pentoxide, the balance being silicon dioxide.

3,913,127
GLASS ENCAPSULATED SEMICONDUCTOR DEVICE CONTAINING CYLINDRICAL STACK OF SEMICONDUCTOR PELLETS

Kensuke Suzuki; Takeshi Ishizuka, and Takeshi Sasaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 293,098, Sept. 28, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,117
Claims priority, application Japan, Oct. 1, 1971, 46-76360
Int. Cl.² H01L 23/30
U.S. Cl. 357—73 17 Claims



1. A high-voltage semiconductor device comprising:

a. a rectifier unit, which includes first and second electrodes, a plurality of semiconductor pellets each having a rectifying PN junction exposed at the periphery of each of said pellets and interposed between said electrodes, and a plurality of soldering material layers made of aluminum and disposed between adjacent ones of said pellets, mechanically and electrically bonding and connecting said pellets with each other, said pellets and said soldering material layers being laminated together in the form of a stack with said first and second electrodes being disposed in contact with the soldering material layers at opposite ends of said stack; and

b. a protective glass layer for passivating the PN junctions of said pellets and for protecting said rectifier unit against mechanical ambient stress and having a prescribed coefficient of thermal expansion not smaller than the effective coefficient of thermal expansion of said rectifier unit, surrounding and contiguous to the exposed surfaces of said pellets, said glass layer extending from the periphery of said first electrode to the periphery of said second electrode and being contiguous to the peripheries of said electrodes so that a compressive stress is imparted to the rectifier unit in the axial direction thereof.

3,913,128
HIGH RESOLUTION COLOR TV MICROSCOPE APPARATUS

Francois J. G. Van den Bosch, 11 Hillcrest Road, Cedar Grove, N.J. 07009

Filed July 13, 1973, Ser. No. 379,099
Int. Cl.² H04N 9/07
U.S. Cl. 358—42 14 Claims

1. A TV system having a specified frame and field rate for the microscopic display of a subject, comprising:

source means for generating a number of successively repetitive discrete bandwidth spectra within a number of respective different spectra to irradiate said subject;

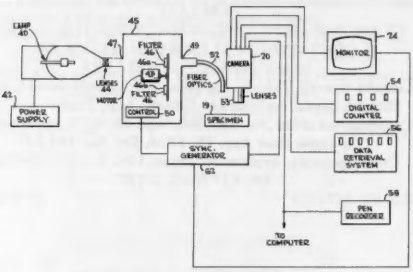
transducer means responsive to the successive irradiation of said subject for generating electrical signals representative thereof;

means for displaying the successive discrete bandwidth spectra radiated from said subject;

synchronization means for generating signals for synchronizing said source means, said transducer means and said means for displaying with said frame and field rate; and

said source means includes a light source radiating white

light and a monochromator responsive to said white light for generating said discrete bandwidth spectra; and said



signals generated by said synchronization means synchronize said monochromator with said frame and field rate.

3,913,129

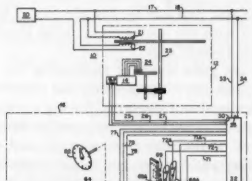
OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS

Carl J. Snyder; Albert H. Maxwell, Jr., and William P. Doby, all of Raleigh, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 26, 1974, Ser. No. 509,613

Int. Cl.² G01D *9/04*; G01R *13/04*

U.S. Cl. 360—6 **8 Claims**



1. A data recorder for recording metering information of a measured quantity subject to an interruption during outage conditions, comprising:

a data input for receiving pulses responsive to predetermined amounts of a measured quantity;

a time impulse control means actuated at regular time intervals;

an outage detector including a switching control means having one conductive condition in response to presence of said measured quantity and opposite conductive condition in response to the absence of said measured quantity;

a data recording circuit means connected to said data input to generate data recording pulses;

a time recording circuit means including said time impulse control means for generating time interval pulses in response to each actuation of said time impulse control means;

an outage indicating circuit means including said switching control means, said outage indicating circuit means being connected to said time recording circuit means to generate a separate outage pulse in said time recording circuit in response to said switching control means being operated between said one and said opposite conductive conditions such that said outage pulse is produced in said time recording circuit means in a predetermined relationship prior to a time interval pulse generated subsequent to an outage condition in said measured quantity.

3,913,130

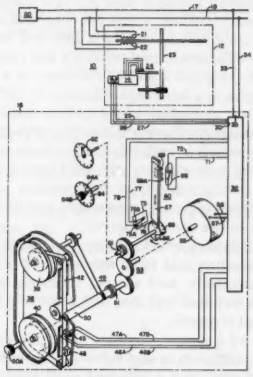
OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS

William P. Doby, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 26, 1974, Ser. No. 509,614

Int. Cl.² G01D *9/04*; G01R *13/04*

U.S. Cl. 360—6 **10 Claims**



1. A data recorder for recording metering information of a measured quantity subject to interruptions during outage conditions, comprising:

a data input for receiving pulses responsive to predetermined amounts of a measured quantity;

a time impulse control means actuated at regular time intervals;

an outage detector including a switching control means having a one conducting condition in response to presence of said measured quantity and an opposite conductive condition in response to the absence of said measured quantity;

a continuously energized data recording circuit means connected to said data input to generate data recording pulses in response to the pulses received at said data input;

a time recording circuit means including said time impulse control means for periodically energizing the time recording circuit means so as to generate time interval pulses having a predetermined time duration in response to each actuation of said time impulse control means;

an outage indicating circuit means including said switching control means, said outage indicating circuit means being connected to said time recording circuit means for periodically energizing the time recording circuit means for a substantially shorter time duration than does said time impulse control means to generate a separate outage pulse in said time recording circuit in response to said

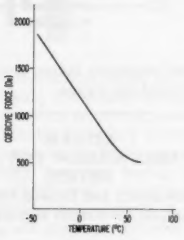
switching control means being operated between said one and said opposite conducting conditions such that said outage pulse is produced in a predetermined relationship prior to a time interval pulse generated after an outage condition in said measured quantity with said outage pulse having a substantially shorter duration than said time interval pulses.

3,913,131

METHOD OF MAGNETIC CONTACT DUPLICATION USING TEMPORARY REDUCTION IN COERCIVITY OF MASTER

Tatsuji Kitamoto; Mahito Shimizu; Masaaki Fujiyama, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 8, 1973, Ser. No. 368,435
Claims priority, application Japan, June 9, 1972, 47-57396
Int. Cl. G11b *5/86*
U.S. Cl. 360—17 **1 Claim**



1. A method for copying magnetic signals on a high density video magnetic recording medium having a magnetic recording layer of a magnetic material, the coercive force of which is between the range of 200 and 1500 oersteds and which is substantially constant with temperature, comprising:

making a master magnetic video record at room temperature to about 50°C on a high density video magnetic recording medium having a magnetic recording layer of magnetic material, the coercive force of which increases rapidly with decreasing temperature and has a value of between 2.5 and 3 times the coercive force of the recording medium on which the high frequency magnetic signals are to be copied at a temperature down to about −40°C, the increase in coercive force of the magnetic material of the master magnetic video record at −40°C being at least 20 percent greater than its coercive force at the temperature at which the master magnetic video record is made, cooling said master magnetic video record to a temperature down to about −40°C, placing the video magnetic recording medium on which the high frequency magnetic signals are to be copied in contact with said master magnetic video record, and subjecting the contacted recording medium and master record to a magnetic transfer field so as to accomplish magnetic copying at said temperature.

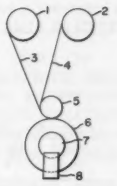
3,913,132

METHOD FOR RECORDING CONTROL SIGNAL ON MASTER TAPE IN CONTACT VIDEO TAPE PRINTER

Masahiro Deguchi, Yao, and Masaru Hashirano, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 20, 1973, Ser. No. 426,827
Claims priority, application Japan, Dec. 30, 1972, 48-2953
Int. Cl. G11b *5/86*
U.S. Cl. 360—17 **3 Claims**

1. A method for duplicating a control signal from a master tape onto a copy tape in a video tape duplicator of the type wherein magnetic layers of a master tape and a copy tape are brought into close contact with one another to enable the printing of the signal recorded on the master tape onto the copy tape; said method comprising recording a control signal on said master tape having a gradient of one of its leading and



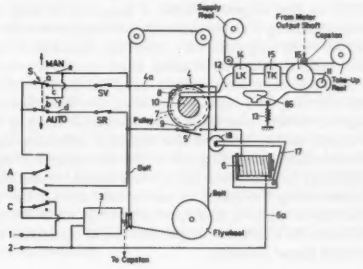
trailing edges that is gentler than the other of said leading and trailing edges, then bringing said master tape with said control signal recorded thereon into close contact with said copy tape and duplicating said control signal on said master tape onto said copy tape.

3,913,133

METHOD AND APPARATUS FOR AUTOMATIC REPEATED PRODUCTION OF INFORMATION ON SELECTED PORTIONS OF MAGNETIC WIRE OR TAPE

Alois Aregger, Mutschellenstrasse 33, 8002 Zurich, Switzerland

Filed Nov. 2, 1973, Ser. No. 412,440
Int. Cl.² G11B *15/18, 19/06, 15/26*
U.S. Cl. 360—72 **19 Claims**



18. An automatic repeat system for replaying a segment of taped information in a tape storage device, comprising: an unwinding spindle; a winding spindle; means for reversing the direction of travel of the tape; tape driving means capable of being switched on and off, comprising, two resettable counters operating opposed to each other and capable of being coupled to said unwinding spindle, one of said counters counting the advance of the tape from the beginning to the end of the segment and the other of said counters counting the return of the tape from the end to the beginning of the segment; terminal switches cooperating with said counters; control means coupled to said terminal switches for switching on said tape driving means; and means for reversing the direction of travel of the tape.

3,913,134
MOTOR DRIVE INCLUDING STARTING AND RUNNING SPEED CONTROL PARTICULARLY FOR MAGNETIC TAPE TRANSPORT SYSTEMS

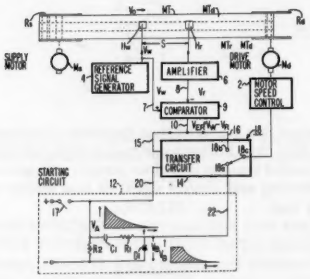
John E. Sargunar, Fife, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 29, 1974, Ser. No. 456,151

Claims priority, application United Kingdom, May 2, 1973, 20837/73

Int. Cl.² G11B *15/48, 15/52*

U.S. Cl. 360—73 **10 Claims**



1. A magnetic tape transport system for driving a magnetic tape at a commanded linear velocity, comprising : a drive reel; a motor for driving the drive reel; a supply reel for the magnetic tape; means for recording data signals on at least one data track on the magnetic tape; a magnetic writing head; means for inputting a sinusoidal reference signal to said writing head for recording same on a reference signal track on the magnetic tape; a magnetic reading head spaced a predetermined distance from said writing head in the direction of travel of the magnetic tape and reading the recorded reference signal; means amplifying the magnetic reading head output signal to the level of the inputted reference signal; means vectorially subtracting one of the said latter two signals from the other to produce a speed error signal; speed control means controlling the speed of said motor driving the drive reel; and means applying said speed error signaal to the speed control means to cause the magnetic tape to be driven at the commanded linear velocity.

3,913,135
ANALOG AND DIGITAL TAPE RECORDER INCORPORATING LEGEND DISPLAYING MEANS

Jean J. Damiamian, 4, rue Lazare Carnot, 92140 Clamart, France

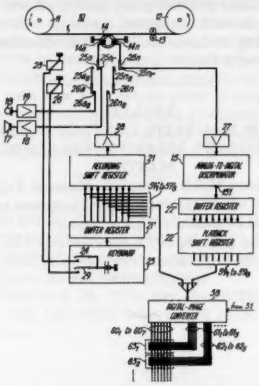
Filed Dec. 26, 1973, Ser. No. 427,484

Claims priority, application France, Dec. 26, 1972, 72.46239

Int. Cl.² G11B *31/00*

U.S. Cl. 360—79 **2 Claims**

1. A tape recorder comprising means for recording on a movable magnetic tape analog signals, digital signals representing alpha-numerical characters associated with said analog signals, synchronizing signals and display control signals, means for reading-out said analog signals, digital signals, synchronizing signals and display control signals from said magnetic tape, means for displaying said alpha-numerical characters, means for activating said displaying means controlled by said display control signal reading-out means and means for



synchronizing said displaying means controlled by said synchronizing signal read-out means.

3,913,136
LATCHING ARRANGEMENT FOR A RECORDING DEVICE

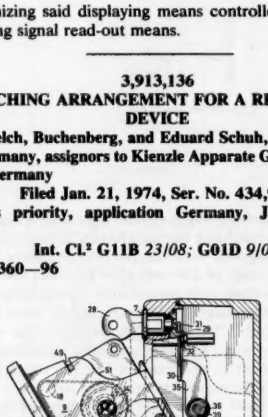
Heinz Kelch, Buchenberg, and Eduard Schuh, Villingen, both of Germany, assignors to Kienzle Apparate G.m.b.H., Villingen, Germany

Filed Jan. 21, 1974, Ser. No. 434,980

Claims priority, application Germany, Jan. 24, 1973, 2303321

Int. Cl.² G11B *23/08;* G01D *9/03*

U.S. Cl. 360—96 **11 Claims**

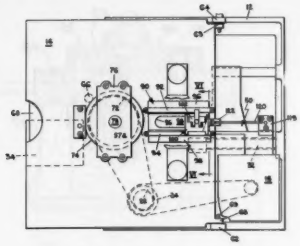


1. A recording device, particularly for the electrographic recording of measured values on a strip-shaped record carrier stored in a cassette having a take-up hub, comprising a housing; a cover mounted on said housing for movement with respect thereto between an open end and a closed position; means in said cover for receiving the respective cassette for movement with respect to said cover between a loosely inserted and an operative position; means for recording information on the record carrier when said cassette is in said operative position; and means operative when said cover is in said closed position for latching said cover in said closed position and for simultaneously moving said cassette relative to said cover into said operative position and into recording contact with said recording means while engaging said driving means with said take-up hub of said cassette.

3,913,137
TWIN FLEXIBLE DISC RECORDER WITH MOVABLE HEADS

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Nov. 23, 1973, Ser. No. 418,299
Int. Cl. G11b *17/00, 5/54, 21/02*
U.S. Cl. 360—98 14 Claims

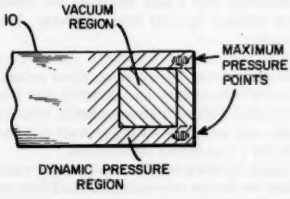


1. A data recorder/reproducer device for use with flexible disc-type magnetic media, comprising in combination: a pair of mutually spaced disc-receiver means, each defining a narrow slot-like receptacle for separately receiving a recording disc and removably retaining the latter generally in predetermined position therein, and each having opening-defining means for access to a disc therein; a pair of commonly coupled drive hub means disposed between said disc-receivers each thereof for engaging and rotating a different disc received in a different one of said receiver means; rotary drive means commonly coupled to said drive hub means to drive both thereof; a pair of magnetic heads, each for proximately engaging and transducing signals recorded on different ones of said discs; separate carrier means mounting each said two magnetic heads for movement toward and away from the plane of a disc in a disc receiver proximate thereto, into and out of accurately-located fixed position in which each such head protrudes into the narrow slot-like receptacle of said disc-receivers and into the plane of rotation of a disc therewithin engaged and rotated by said hub means; and translational drive means commonly coupled to said magnetic heads to move each thereof laterally across the surface of the disc which is proximate thereto.

3,913,138
FLYING MAGNETIC STRIP HEAD

Raymond J. Stankiewicz, Philadelphia, and Edwin R. Phillips, Rosemont, both of Pa., assignors to Sperry Rand Corporation, Blue Bell, Pa.

Filed Dec. 26, 1973, Ser. No. 427,764
Int. Cl. G11b *5/60*
U.S. Cl. 360—103 9 Claims



1. In a low mass flying head arrangement for use with a rotating memory device comprising:

a. a cantilevered strip of flexible material;

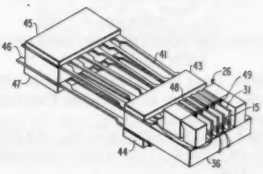
b. a pivotless magnetic head located integral with said strip for recording, or in the alternative, reading information from said memory device;

c. vacuum means located along the end of said strip for forming a vacuum to load said head into proximity with the surface of said memory and for forming a dynamic air bearing under said strip, whereby head crash damage into said memory surface is prevented or minimized.

3,913,139
MULTIELEMENT MAGNETIC HEAD COMPRISING A COMMON MAGNETIC MEMBER UNITING POLE TIPS AND AN OPPOSING MAGNETIC MEMBER

Masaru Ito, and Sadayuki Mitsuhashi, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 26, 1973, Ser. No. 373,841
Claims priority, application Japan, Sept. 22, 1972, 47-95881
Int. Cl.[2] G11B *5/60*
U.S. Cl. 360—103 1 Claim



1. A magnetic head comprising a plurality of first magnetic members having first ends and aligned second ends, a coil provided around each of said first magnetic members between the first and second ends thereof, a second magnetic member having a first end spaced apart from said first ends of said first magnetic members and a second end defining a plurality of aligned magnetic gaps in cooperation with said second ends of said first magnetic members, said first ends of said first magnetic members and said first ends of said second magnetic member being aligned in a common plane intersecting a plane passing through said magnetic gaps, and a third magnetic member uniting said first ends of said first magnetic members and said first end of said second magnetic member, said third magnetic member having surface portions aligned on a common plane and brought into contact with said first ends of said first magnetic members and said first end of said second magnetic member and serving as a spacer for a plurality of parallel leaf springs for urging said magnetic head towards a magnetic recording medium.

3,913,140
TRACK INDEXING INDICATOR FOR A TAPE PLAYER

Tadashi Iijima, Zushi, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

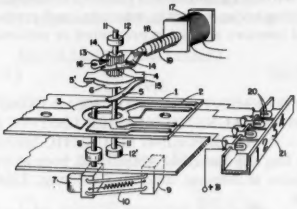
Continuation of Ser. No. 839,872, July 8, 1969. This application Oct. 15, 1971, Ser. No. 189,766
Int. Cl.[2] G11B *5/55*
U.S. Cl. 360—106 4 Claims

1. In a multi-track tape recording or reproducing device in which the recording or reproducing head is positioned adjacent predetermined ones of the tracks by a cam follower controlled by a head positioning cam having a plurality of cam surfaces corresponding to the different tracks to which the head may be positioned, a track position indicating apparatus including in combination:

a plurality of electrical indicating devices equal in number to the number of positions to which the head can be positioned;

switch means connected in an energizing circuit for each of the indicating devices;

switch operating means carried by said head positioning cam for movement therewith, said switch operating



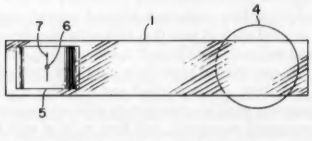
means cooperating with a selected switch means corresponding to the particular indicating device for the head position selected by the position of the cam to thereby complete an energizing circuit for the selected indicating device.

3,913,141

HEAD AZIMUTH POSITIONING METHOD USING NEWTON'S RINGS

Gary W. Collins, Long Beach, and Daniel M. Klang, Irvine, both of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Apr. 24, 1974, Ser. No. 463,674
Int. Cl.² G11B *21/24, 5/56;* G01B *9/02*
U.S. Cl. 360—109 **1 Claim**



1. A method for aligning the gap between the poles of a magnetic head of the type having a curved surface comprising the steps of:

positioning a flat rigid transparent surface in contact with the curved surface of the magnetic head;

orienting the head azimuth while maintaining contact with the transparent surface;

observing the interference produced at the contact point between the curved head and the transparent surface as the azimuth orientation of the head is changed;

fixing the orientation of the head when the interference is coincident with the gap.

3,913,142

HEAD INTERLACING TECHNIQUE

Michael J. Raffetto, Palos Verdes Peninsula; Ted Otto, Huntington Beach, and Willard John Opocensky, Los Angeles, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1974, Ser. No. 449,880
Int. Cl. G11b *5/56, 5/27*
U.S. Cl. 360—109 **8 Claims**

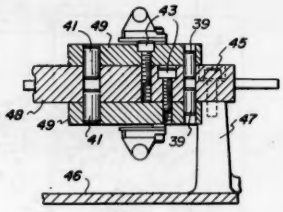
6. In a head-per-track disk file system, apparatus for interlacing heads comprising:

a disk containing 2*m* equally spaced concentric tracks on one surface thereof,

two head mounting arms extending over said surface of said disk,

m heads attached to said arms, equally spaced apart a distance equal to 2 track widths and along a disk radius, said heads being attached to said arms by spring means for urging said heads against said disk surface, and

an arm support member mounted in the disk plane and beyond the periphery of said disk and having four precision dowel pins protruding upward and perpendicular to said disk plane, two of said dowel pins being used as locator pins which mate with holes drilled in each head



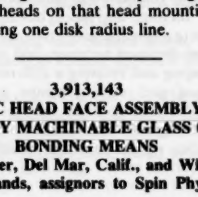
mounting arm, one locator pin being further from the disk center point by an amount equal to half the distance between heads on one head mounting arm; the other two of said dowel pins being used as rotational stops so that when each head mounting arm is mounted on said locator pin and rotated against the corresponding rotational stop, all recording heads on that head mounting arm will be positioned along one disk radius line.

3,913,143

MAGNETIC HEAD FACE ASSEMBLY USING CHEMICALLY MACHINABLE GLASS CERAMIC BONDING MEANS

Robert A. Schneider, Del Mar, Calif., and Willem L. Kroon, Putten, Netherlands, assignors to Spin Physics, Inc., San Diego, Calif.

Filed Jan. 10, 1974, Ser. No. 433,039
Int. Cl.² G11B *5/14, 5/27, 5/42*
U.S. Cl. 360—127 **2 Claims**



2. A magnetic record and/or reproduce head, comprising a face assembly and a rear assembly for completing magnetic circuits defined by said face assembly, said face assembly comprising:

a. first and second members, each comprising first and second ferrite laminations, glass ceramic between said ferrite laminations, and bonding said ferrite laminations, together with said glass ceramic, into an integral assembly, said assembly having at least one face exposing parts of both said ferrite laminations;

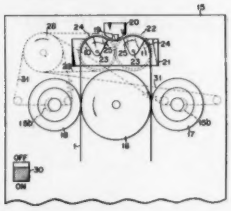
b. means bonding said first and second members together so that the ferrite laminations of said first member align with the ferrite laminations of said second member; and

c. means disposed between the aligned ferrite laminations for providing non-magnetic gaps between the aligned ferrite laminations, said glass ceramic being comprised of Fotoceram.

3,913,144
MOVABLE TAPE GUIDE MECHANISM

Motoi Yagi, Zushi; Morio Akino, Fujisawa, and Hisaharu Takeuchi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 24, 1974, Ser. No. 463,507
Claims priority, application Japan, Apr. 30, 1973, 48-48148
Int. Cl.² G11B 15/66, 15/24, 23/04
U.S. Cl. 360—130 9 Claims



1. A tape cassette device onto which a tape cassette provided with a tape wound around a reel is received, comprising:

a scanning head;

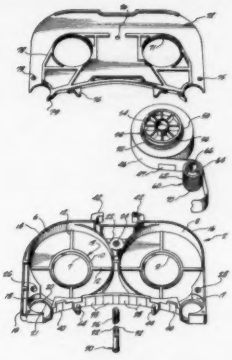
a guide mechanism disposed opposite the scanning head so as to define a tape passage therebetween within which the tape is disposed, said guide mechanism having a pair arcuately configured guides positioned adjacent to and on opposite sides of the scanning head, and means mounting each guide for rotation in proximity to the scanning head; and

means for selectively rotating said guides between a first position at which said guides are disposed away from the scanning head to widen the tape passage to be sufficiently wide whereby said tape may be freely inserted within said tape passage without contacting either said scanning head or said guides and a second position substantially diametrically opposite said first position to narrow the tape passage whereby said tape is forced into contact with and wrapped about said scanning head by said guides so as to insure stable travelling of said tape.

3,913,145
CASSETTE TRANSPORT SYSTEM WITH DRIVE REEL LOCKING MEANS

Selmer Wiig, Walnut, Calif., assignor to Lockheed Electronics Co. Inc., Azusa, Calif.

Continuation of Ser. No. 277,654, Aug. 3, 1972, abandoned.
This application Apr. 29, 1974, Ser. No. 464,759
Int. Cl.² G11B 23/06, 15/22
U.S. Cl. 360—132 15 Claims



1. A cassette for storing elongated material, such as tape, operable on a transport member having both transport releasable means for releasing the elongated material in the cassette for recoding and retrieval of information and means for moving the elongated material, comprising:

a cassette housing member;

means for supporting the elongated material in the housing including at least one reel for winding the elongated material thereon;

locking means on the housing for contacting the reel to both support the reel, and maintain a fixed relative position of the reel and the elongated material, when the cassette is not operatively mounted on the transport member; and

means on the housing, including at least a portion of the housing that is relatively movable away from the reel, for coacting with the transport releasable means, responsive to the cassette being operatively mounted on the transport, both to release the reel to permit movement of the elongated material on the reel for recording and retrieval of information and to remove any support of the reel and the elongated material by the housing.

DESIGNS

GRANTED OCTOBER 14, 1975

ERRATA

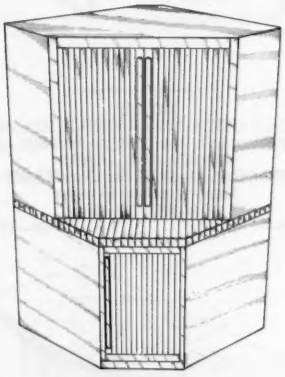
For CLASS	See PATENT NO.
034–015 AD	237,204

DESIGNS

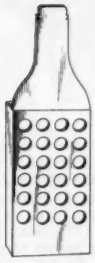
OCTOBER 14, 1975

237,123
AUXILIARY ORTHOPEDIC SEAT
Jean Gunnar Hogkvist, Strakvagen 8, 180 21 Osterskar, Sweden
Filed Nov 8, 1973, Ser. No. 413,998
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

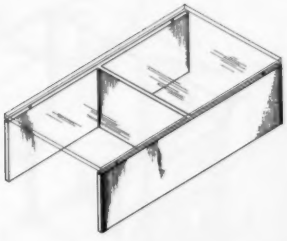
237,124
CORNER PANTRY CABINET
Ronald D. Pearson, 12320 98th Ave. E., Puyallup, Wash. 98371
Filed Nov. 12, 1973, Ser. No. 415,287
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—146



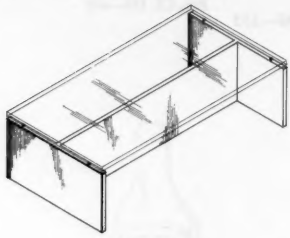
237,125
BOTTLE DISPLAY STAND OR SIMILAR ARTICLE
Jerome A. Moss, 333 West End Ave., New York, N.Y. 10023
Filed Mar. 12, 1973, Ser. No. 340,442
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153



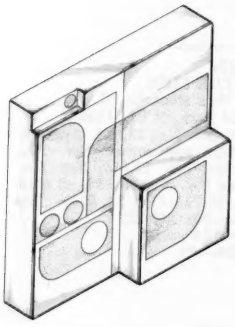
237,126
TABLE OR THE LIKE
Ronald J. McDonald, New Rochelle, N.Y.
(76—59 264th St., Floral Park, N.Y. 11004)
Division of design application Ser. No. 22,536, Apr. 20, 1970. Continuation of design applications Ser. No. 18,144, Ser. No. 18,145, Ser. No. 18,150, Ser. No. 18,151, Ser. No. 18,152, and Ser. No. 18,155, all filed June 18, 1969, and Ser. No. 20,723, Dec. 31, 1969. This application Jan. 10, 1973, Ser. No. 322,528
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

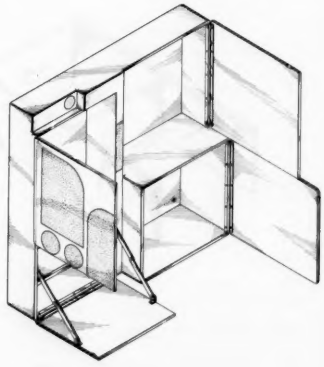


237,127
TABLE OR THE LIKE
Ronald J. McDonald, New Rochelle, N.Y.
(76—59 264th St., Floral Park, N.Y. 11004)
Division of design application Ser. No. 22,536, Apr. 20, 1970. Continuation of design applications Ser. No. 18,144, Ser. No. 18,145, Ser. No. 18,150, Ser. No. 18,151, Ser. No. 18,152, and Ser. No. 18,155 all filed June 18, 1969, and Ser. No. 20,723, Dec. 31, 1969. This application Jan. 10, 1973, Ser. No. 322,529
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

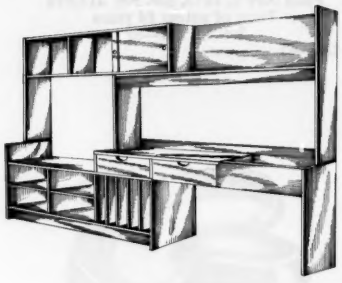


237,128
WALL HUNG STORAGE UNIT
Richard Kahn, 17 Diamond Drive, Plainview, N.Y. 11803
Filed Nov. 4, 1974, Ser. No. 520,937
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

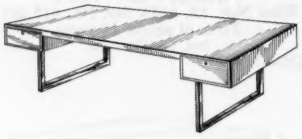




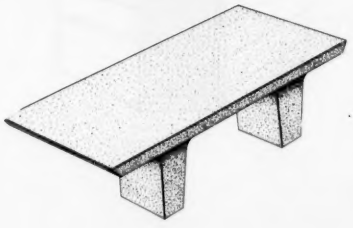
237,129
MUSIC SUITE
Tord Kempe, Degeberga, Sweden, assignor to Abra Mobler AB, Taberg, Sweden
Filed Nov. 6, 1973, Ser. No. 413,264
Claims priority, application Sweden May 7, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



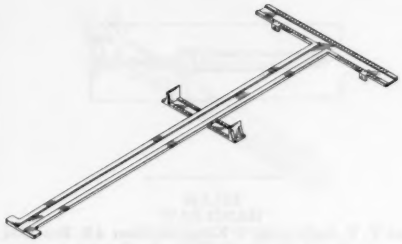
237,130
TABLE
Ralph N. San Giovanni, Bricktown, N.J., assignor to Buck Engineering Co., Inc., Farmingdale, N.J.
Filed June 27, 1973, Ser. No. 374,038
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—159



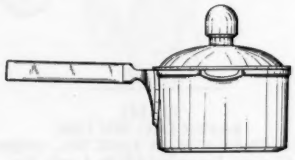
237,131
CONCRETE TABLE
Everett T. Lee, 2832 S. 46th St., Phoenix, Ariz. 85040
Filed Dec. 11, 1972, Ser. No. 313,650
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



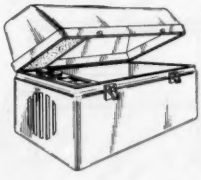
237,132
DRAWER SLIDE OR SIMILAR ARTICLE
Martin O. Riley, 1330 Hillcrest Ave., Pasadena, Calif. 91106
Filed Aug. 30, 1973, Ser. No. 393,011
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



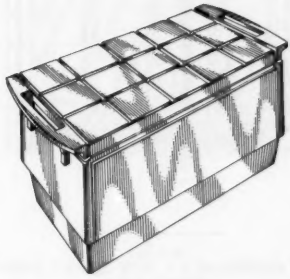
237,133
SAUCEPAN
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Feb. 28, 1974, Ser. No. 447,111
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—65



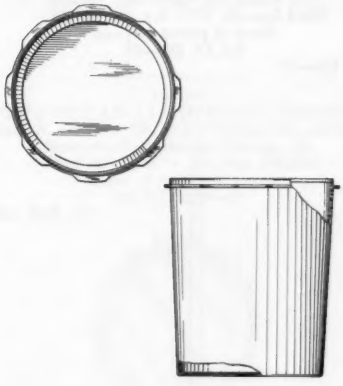
237,134
COMBINED LUNCH BOX AND RADIO
John C. Westmoreland, 627 Holcomb Road, Dallas, Tex. 75218
Filed Feb. 19, 1974, Ser. No. 443,363
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D7—76



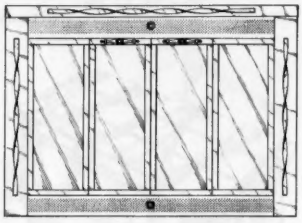
237,135
COOLER CHEST
Morris N. Wiant, Regis D. Schulte, Benjamin C. Baugh, Robert R. Deines, and James R. Feimster, Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed June 1, 1973, Ser. No. 366,154
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—77

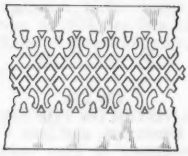


237,136
CANISTER OR THE LIKE
James B. Swett, Barrington, and Jack V. Croyle, Woonsocket, R.I., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed Feb. 3, 1970, Ser. No. 21,251
Term of patent 14 years
The term of this patent subsequent to Dec. 14, 1992, has been disclaimed
Int. Cl. D9—*02;* D7—*07*
U.S. Cl. D7—79



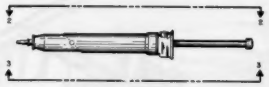
237,137
FIREPLACE SCREEN
Floyd R. Clark, 9014 N. Richmond Ave., Portland, Oreg. 97203
Filed Nov. 8, 1973, Ser. No. 414,610
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208



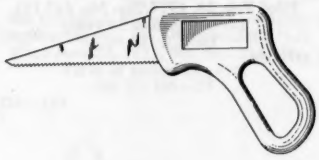


237,138
VEHICLE DOOR KNOB LIFTER
Leon A. Drake, East Gary, Ind. (933 Miami St., Gary, Ind. 46403)
Filed June 18, 1973, Ser. No. 371,154
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—19

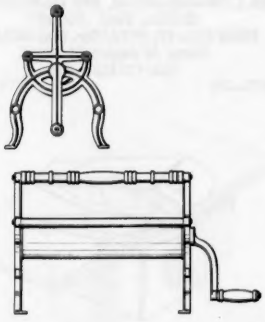
237,139
PORTABLE DESOLDERING TOOL OR THE LIKE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402
Filed Aug. 17, 1973, Ser. No. 389,382
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



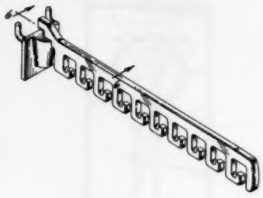
237,140
HAND SAW
Allan Y. T. Andersson, % Kungsmaskiner AB, Box 2044, S–421 02 Vastra Frolunda, Sweden
Filed Mar. 7, 1973, Ser. No. 338,742
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—95



237,141
PAPER LOG ROLLER
Louis J. Christen, Jr., St. Louis, Mo., assignor to Christen Incorporated, St. Louis, Mo.
Filed Aug. 30, 1974, Ser. No. 501,861
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—222

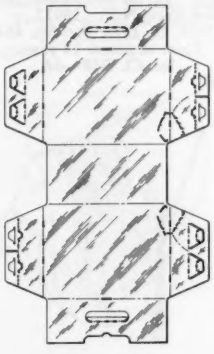


237,142
COMBINED HANGER ARM AND BRACKET FOR USE WITH PERFORATED PANELS
Richard Dale Barnes, Rockford, Ill., assignor to Southern Imperial, Inc., Rockford, Ill.
Filed July 15, 1974, Ser. No. 488,724
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—255

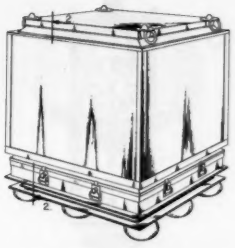


237,143
STORAGE CONTAINER
Bengt Anders Bjork, Eskilstuna, Sweden, assignor to AB Nike Hydraulik, Eskilstuna, Sweden
Filed May 18, 1973, Ser. No. 361,785
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

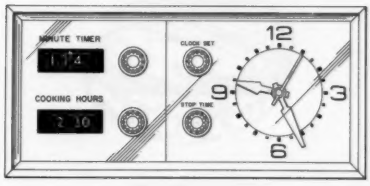
237,144
CARTON BLANK
Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Feb. 14, 1974, Ser. No. 442,610
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—245



237,145
COMBINED REUSABLE EQUIPMENT TRANSPORTER AND STORAGE MODULE
Josiah M. Barr, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Feb. 11, 1974, Ser. No. 441,687
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—246



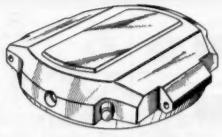
237,146
CONTROL PANEL FOR A COMBINED CLOCK AND TIMER
Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Apr. 30, 1974, Ser. No. 465,481
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2



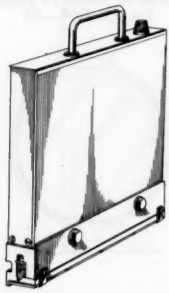
237,147
HOUSING FOR AN ALARM CLOCK OR THE LIKE
Richard K. Thomas, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 5, 1974, Ser. No. 486,026
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—23

237,148
CLOCK
Heinz Jauch, 4 Herderstrasse, 7220 Villingen-Schwenningen, Germany
Filed Oct. 5, 1973, Ser. No. 403,921
Claims priority, application Germany Apr. 6, 1973
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—29

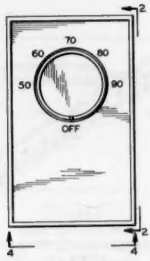
237,149
WRIST WATCH
Takashi Watanabe, Tokyo, Japan, assignor to Ricoh Watch Co., Ltd., Nagoya, Japan
Filed Apr. 15, 1974, Ser. No. 460,685
Claims priority, application Japan Oct. 13, 1973
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D10—38



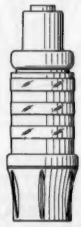
237,150
FAULT DETECTOR FOR PAPER WEBS
Pentti Kalervo Mannonen, 6 D 51 Kuohukuja, 01600 Myyrmaki, Finland
Filed July 2, 1973, Ser. No. 375,523
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



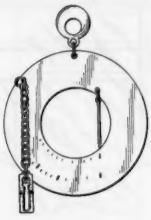
237,151
ROOM THERMOSTAT
Herbert J. Taylor, Aloha, Oreg., assignor to Sunne Controls Division of PECO Manufacturing Co., Inc., Portland, Oreg.
Filed Sept. 13, 1973, Ser. No. 397,016
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—50



237,152
PNEUMATIC TIRE PRESSURE TESTER
Gary R. Bluem, 7980 Wynnwood Road, Minneapolis, Minn. 55427
Filed May 23, 1974, Ser. No. 472,708
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—86

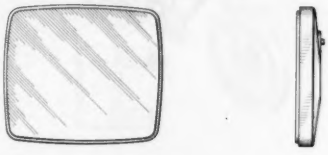


237,153
POSTAL SCALE
Ronald Steve Golden, 442 California Road, Bronxville, N.Y. 10708, Jane Deborah Wolk, 19 Old Farm Lane, Hartsdale, N.Y. 10530, and Ronald M. Greeney, 412 E. 55th St., New York, N.Y. 10022
Filed Nov. 12, 1973, Ser. No. 414,750
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—87

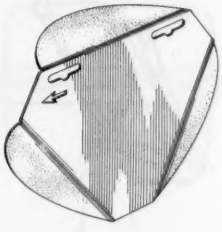


237,154
TRAFFIC SIGN FOR A SCHOOL ZONE
Richard B. Boone, 2321 Catalo Lane, Arlington, Tex. 76010
Filed Apr. 29, 1974, Ser. No. 465,203
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

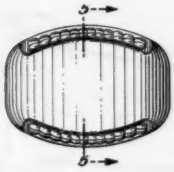
237,155
BICYCLE REFLECTOR
Frank P. Brilando and Rudolph L. Schwinn, Niles, Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.
Filed Mar. 29, 1974, Ser. No. 456,356
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



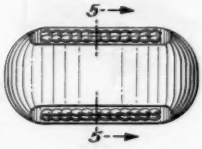
237,156
BICYCLE REFLECTOR
Bennie L. McEwin, 352 E. Papago Drive, Tempe, Ariz. 85281
Filed Dec. 10, 1973, Ser. No. 423,523
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



237,157
ROADWAY MARKER
Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation
Filed Sept. 9, 1974, Ser. No. 504,327
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113

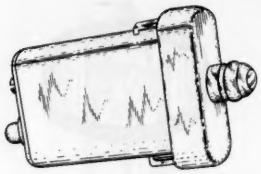


237,158
ROADWAY MARKER
Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation
Filed Sept. 9, 1974, Ser. No. 504,328
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113

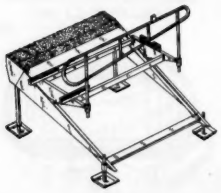


237,159
ROADWAY MARKER
Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation
Filed Sept. 9, 1974, Ser. No. 504,326
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113

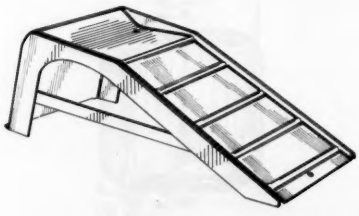
237,160
IMMERSION RESPONSIVE SIGNAL LAMP
Richard D. McClintock, Washington Road, Woodbury, Conn. 06798
Filed Sept. 19, 1973, Ser. No. 398,814
Term of patent 14 years
Int. Cl. D10—*06;* D26—*02*
U.S. Cl. D10—114



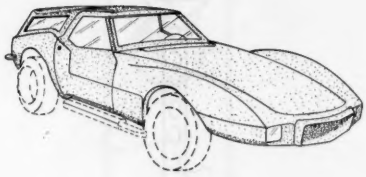
237,161
BOAT LIFTING AND DOCKING DEVICE
Burdette R. Kramer, Rte. 2, New London, Minn. 56273
Filed Jan. 24, 1974, Ser. No. 436,085
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—53



237,162
CAR RAMP
Jack V. Miller, Sierra Madre, Calif., assignor to Orion Industries, Inc.
Filed Sept. 6, 1974, Ser. No. 503,947
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—53



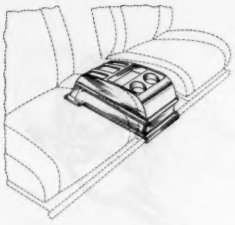
237,163
STATION WAGON BODY
Charles L. Miller, Southgate, Mich. (31 Delisle, River Rouge, Mich. 48218)
Filed May 31, 1973, Ser. No. 365,571
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



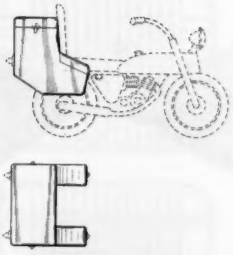
237,164
BICYCLE
Ronald Ralph Knapp, Hacienda Heights, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.
Filed Aug. 16, 1974, Ser. No. 497,876
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

237,165
BICYCLE FRAME
James J. Feuhrer, Mohawk, N.Y., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.
Filed July 16, 1974, Ser. No. 488,904
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

237,166
AUTOMOBILE CONSOLE FOR BUCKET SEATS
Wallace Jensen, 3037 East 2965 South, Salt Lake City, Utah 84109
Filed Nov. 15, 1972, Ser. No. 306,854
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

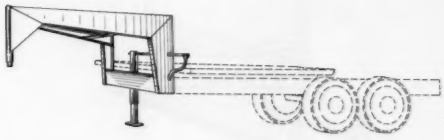


237,167
CONTAINER UNIT FOR MOTORCYCLES AND THE LIKE
Elmer K. Hanes, Jr., 400 Young Ave., Dupo, Ill. 62239
Filed May 3, 1974, Ser. No. 466,809
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



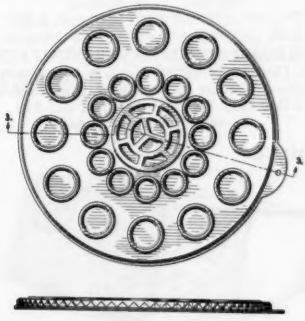
237,168
BICYCLE PANNIER
Clyde A. Scott, 7012 19th Ave. NE. 98115, and Lloyd H. Perry, 11311 20th Ave. NE. 98125, both of Seattle, Wash.
Filed May 20, 1974, Ser. No. 471,483
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

237,169
EXTENDED COUPLING FOR A TRAILER
David H. Hill, Ramsey, and Robert A. Marquardt, Lebanon, Ill., assignors to Tri-Star Corporation, Fillmore, Ill.
Filed Nov. 1, 1973, Ser. No. 411,669
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

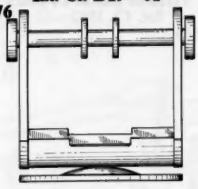


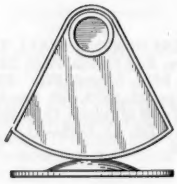
237,170
INTERLOCKING WALL UNIT
Milton A. Wallace, Bell Haven Park, 3200 NW. 79th St., Apt. 1925, Miami, Fla. 33147
Filed Apr. 23, 1973, Ser. No. 353,464
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 R

237,171
PALETTE
Frances Tyler Norman, 3832 Olympia Drive, Houston, Tex. 77019
Filed Feb. 14, 1974, Ser. No. 442,500
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35

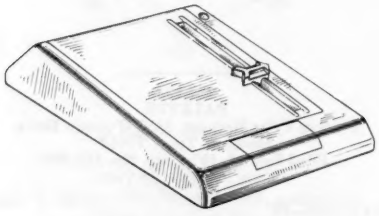


237,172
SWIVELING, ROTARY, CARD HOLDER
Manfred K. Hegemann, Nyack, N.Y., assignor to Zephyr American Corporation, Secaucus, N.J.
Filed Oct. 9, 1973, Ser. No. 404,272
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76





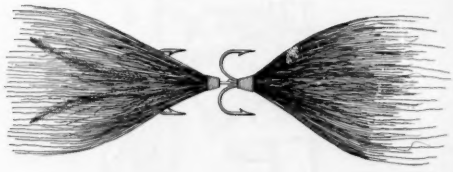
237,173
LIST FINDER
Harold A. White, Stroud, Ontario, Canada, assignor to Hawco Products Limited
Filed Jan. 14, 1974, Ser. No. 433,401
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



237,174
HOLDER FOR A LIGHT SENSING PEN
William A. Hoffman, Collingswood, N.J., assignor to GTE Information Systems Incorporated, Stamford, Conn.
Filed Dec. 17, 1973, Ser. No. 425,118
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—84

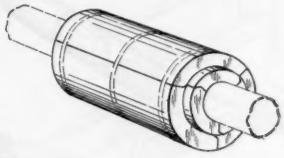
237,175
GUIDE
Ryuichi Ohmura, 19–3 Minami-cho, Shizuoka-shi, Shizuoka-ken, Japan
Filed June 21, 1974, Ser. No. 481,823
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

237,176
FISHING LURE
Ferdinand O. Grassl, River Falls, Wis. 54022
Filed June 10, 1974, Ser. No. 477,929
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

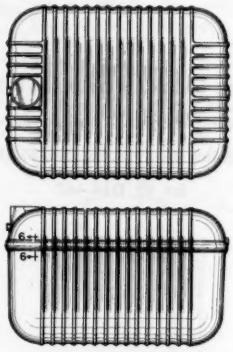


237,177
FISHING LURE
Francis E. Morrell, 243 Dollison St., Eureka, Calif. 95501
Filed Jan. 24, 1974, Ser. No. 436,118
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

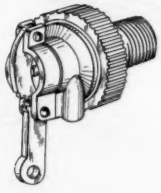
237,178
SECTIONALIZED COMBINATION FLOAT AND PROTECTIVE INSULATING COVERING FOR PIPELINES
William W. Wilson, Raceland, La., assignor to Pipeline Products and Services, Inc., Raceland, La.
Filed Jan. 23, 1974, Ser. No. 435,755
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1



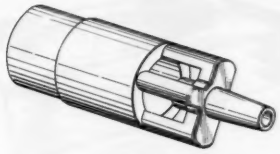
237,179
SEPTIC TANK
Harold A. Laswell, 4609 Walden Drive, Louisville, Ky. 40229
Filed Oct. 9, 1973, Ser. No. 404,685
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



237,180
FLOAT VALVE
Daniel J. Rawdon, New Hartford, Iowa, assignor to Hawkeye Steel Products, Inc., Waterloo, Iowa
Filed Aug. 13, 1974, Ser. No. 496,933
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

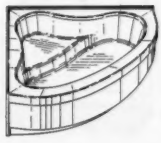


237,181
OXYGEN DILUTER
Loyal G. Netteland, East Aurora, N.Y., assignor to A-T-O Inc., Wiloughby, Ohio
Filed Aug. 24, 1973, Ser. No. 391,292
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—19

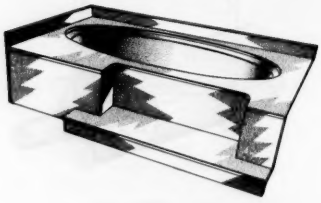


237,182
BATHTUB
Robert I. Rosenhaus, 1805 NE. 118th Road, North Miami, Fla. 33161
Filed Aug. 12, 1974, Ser. No. 496,531
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—55

237,183
BATHTUB
Horst Godfrey Bonsack, Flat 17, 51 South St., London W. 1, England
Filed Nov. 12, 1973, Ser. No. 415,227
Claims priority, application Great Britain June 4, 1973
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



237,184
BATHTUB
Robert I. Rosenhaus, 1805 NE. 118th Road, North Miami, Fla. 33161
Filed Nov. 15, 1974, Ser. No. 524,159
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—55



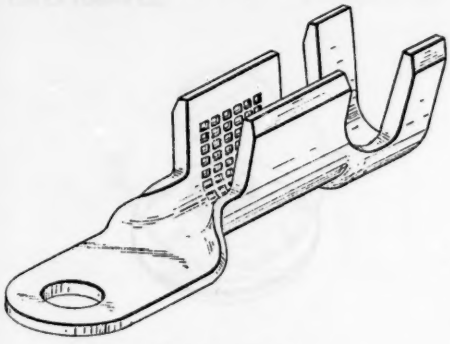
237,185
COMBINED WATER CLOSET SEAT AND COVER
Robert O'Neil, Wheaton, Ill., assignor to Beneke Corporation, Columbus, Miss.
Filed May 10, 1974, Ser. No. 469,037
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

237,186
DENTAL FLOSS HOLDER
Marius J. Morin, 4610 Sepulveda Blvd., Torrance, Calif. 90505
Filed Dec. 17, 1974, Ser. No. 533,790
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

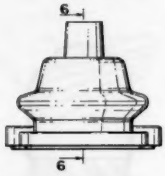
237,187
SELF-CONTAINED BATTERY OPERATED DENTAL APPLIANCE
John B. Fattaleh, 4845 E. Indian School Road, Phoenix, Ariz. 85018
Filed July 26, 1974, Ser. No. 492,194
Term of patent 14 years
Int. Cl. D4—*02*; D24—*02*
U.S. Cl. D24—1 B

237,188
COMBINED BATTERY OPERATED DENTAL APPLIANCE AND RECHARGING RACK
John B. Fattaleh, 4845 E. Indian School Road, Phoenix, Ariz. 85018
Filed July 26, 1974, Ser. No. 492,199
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1

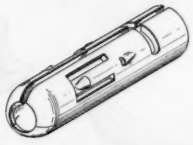
237,189
OPEN BARREL ALUMINUM CABLE CONNECTOR
Timothy Allen Lemke, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 14, 1973, Ser. No. 397,542
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



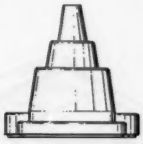
237,190
RUBBER COVER FOR VEHICLE MULTIPOLE CONNECTOR
Saneyoshi Shibata, Nishinomiya, Japan, assignor to The Furukawa Electric Company Limited, Tokyo, Japan
Filed July 5, 1973, Ser. No. 376,385
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



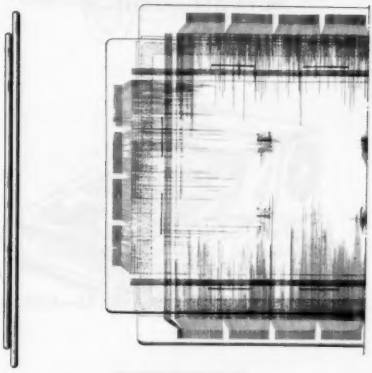
237,191
TRANSFORMER SWITCH TERMINAL
Floyd Harold Renshaw, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed July 5, 1973, Ser. No. 376,864
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



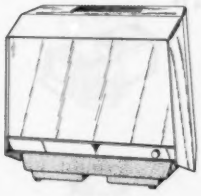
237,192
CONNECTOR COVER
Ikuzo Uesawa, Tokyo, Japan, assignor to The Furukawa Electric Company Limited, Tokyo, Japan
Filed July 5, 1973, Ser. No. 376,384
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 A



237,193
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Jon W. Klotz, Rossford, and Eugene A. Oster and Harold Joseph Hoehn, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 191,961, Oct. 22, 1971, now Patent No. 230,985, dated Mar. 26, 1974. This application Jan. 11, 1974, Ser. No. 432,738
Term of patent 14 years
The term of this patent subsequent to Mar. 26, 1988, has been disclaimed
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



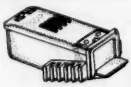
237,194
DISPLAY MONITOR
Herbert J. Hampel, Philadelphia, Pa., assignor to GTE Information Systems Incorporated, Stamford, Conn.
Filed Dec. 17, 1973, Ser. No. 425,119
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



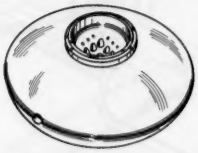
237,195
ELECTRONIC CALCULATING MACHINE
Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 12, 1974, Ser. No. 496,636
Claims priority, application Japan Feb. 25, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

237,196
TERMINAL
Richard Lotter, Ridgewood, and Stanley A. Rosenthal, East Meadow, N.Y., assignors to Decicom Systems, Inc., Farmingdale, N.Y.
Filed Oct. 25, 1974, Ser. No. 518,339
Term of patent 14 years
Int. Cl. D14—*02*; D18—*01*
U.S. Cl. D26—5 C

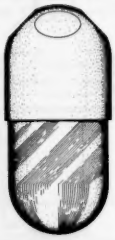
237,197
PICK-UP CARTRIDGE
Leopold Frans Albert Agnes Maria Raport, Kessel-Lo, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 26, 1973, Ser. No. 400,881
Claims priority, application Switzerland Mar. 28, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 D



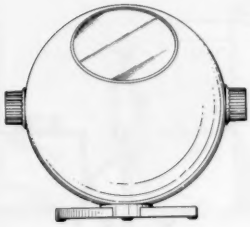
237,198
PIPE
Jack Donald Dollen, 3852 Woods Road, Harrison, Mich. 48625
Filed Feb. 13, 1974, Ser. No. 442,048
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



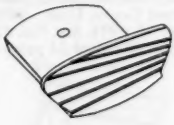
237,199
CAPSULE
Erich W. Sauter, Cornwell Heights, Pa., assignor to Parke, Davis & Company, Detroit, Mich.
Continuation of abandoned design applications Ser. No. 157,064, Ser. No. 157,065, and Ser. No. 157,066, all June 25, 1971. This application July 31, 1973, Ser. No. 384,265
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D32—3



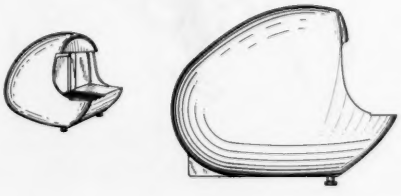
237,200
RECEPTACLE FOR THE RANDOM MIXING AND DISPLAY OF ENCLOSED INSCRIBED PIECES
Savo Bojicic, 5 Suncrest Drive, Don Mills, Ontario, Canada
Filed May 7, 1973, Ser. No. 358,153
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GG



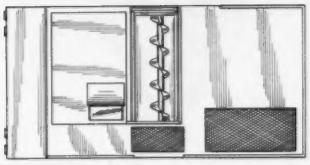
237,201
SOLE PLATE FOR A GOLF CLUB HEAD
Robert J. Mader, Torrance, Calif., assignor to Mader Products, Inc., Gardena, Calif.
Filed Apr. 18, 1974, Ser. No. 462,021
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

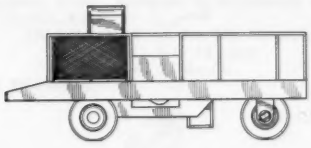


237,202
DENTAL MODEL TRIMMING HOUSING
Velton C. White, 17 N. Broadway, Des Plaines, Ill. 60016
Filed Jan. 12, 1973, Ser. No. 323,285
Term of patent 14 years
Int. Cl. D15—*09*; D24—*02*
U.S. Cl. D37—1 A



237,203
PAVING MACHINE
Frederick J. Silbernagel, Huron, S. Dak., assignor to Precision Paving Products, Inc., Minneapolis, Minn.
Filed Feb. 25, 1974, Ser. No. 445,642
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5





237,204
TOY FIGURE
Samuel F. Speers, 120 Mount Hope St., North Attleboro, Mass. 02703
Filed Feb. 19, 1974, Ser. No. 443,827
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

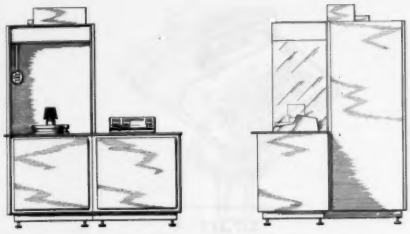
237,205
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis De Loy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,356
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

237,206
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis De Loy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,355
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

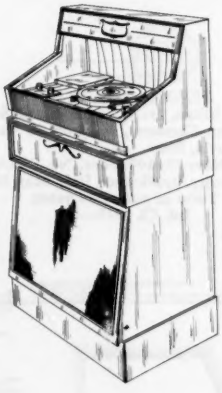
237,207
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis De Loy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,354
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

237,208
COMPONENT FOR GRILLWORK, RAILINGS AND COLUMNS
Ellis De Loy Larson, 225 E. State Road, Pleasant Grove, Utah 84062
Filed May 16, 1974, Ser. No. 470,353
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

237,209
CHEMICAL VAPOR DEPOSITION REACTOR
William George Faraco, Jr., 13561 Howen Drive, Saratoga, Calif. 95070
Filed Sept. 4, 1973, Ser. No. 393,268
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 R

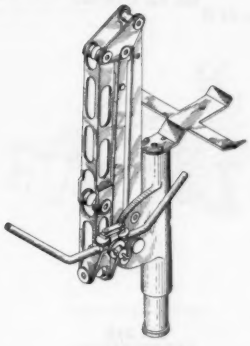


237,210
JUKE BOX
Ronald B. Howes, 6961 Paddison Road, Cincinnati, Ohio 45230
Filed Mar. 22, 1973, Ser. No. 343,786
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

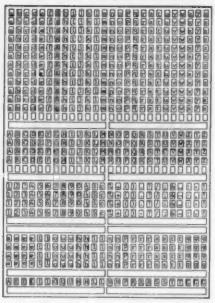


237,211
COMBINED RECORD PLAYER AND RADIO
Youta Takashima, Naoko Hayashi, and Katuhiko Oikawa, Moriguchi, Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Osaka, Japan
Filed Apr. 17, 1973, Ser. No. 351,902
Claims priority, application Japan Nov. 29, 1972
Term of patent 3½ years
Int. Cl. D14—*01, 03*
U.S. Cl. D56—4 R

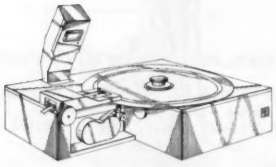
237,212
MICROSCOPE STAND
Joseph G. Stumpf, Fairfield, and William P. Haynes, Bridgeport, Conn., assignors to Frigitronics of Conn., Inc., Shelton, Conn.
Filed Oct. 12, 1973, Ser. No. 406,026
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



237,213
TYPING CORRECTION SHEET
Nicholas Seccafico, Jr., Seldon, N.Y. (% Carbon Paper Corporation, 235 Robbin Lane, Syosset, N.Y. 11791)
Filed May 11, 1973, Ser. No. 359,275
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D59—2 A



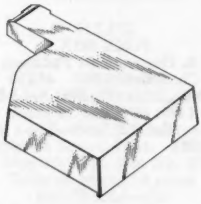
237,214
GRAPHIC FORMING DEVICE
Charles P. Huss, Oak Park Heights, and Frank C. Lunquist, New Brighton, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 15, 1973, Ser. No. 406,549
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



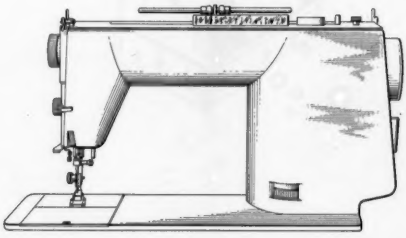
237,215
TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy
Filed June 19, 1974, Ser. No. 480,669
Claims priority, application Italy Dec. 27, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

237,216
PORTABLE TYPEWRITER
Mario Belini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy
Filed June 19, 1974, Ser. No. 480,668
Claims priority, application Italy Dec. 27, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

237,217
RIBBON CARTRIDGE COVER
Ellen V. B. Ludwick, Syracuse, and James E. Harmon, Groton, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Jan. 2, 1973, Ser. No. 320,037
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



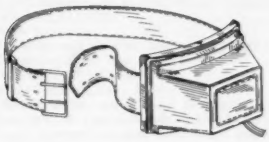
237,218
SEWING MACHINE
Marco Zanuso, Milan, Italy, and Richard Sapper, Stuttgart-Oegerloem, Germany, assignors to Necchi, Societa per Azioni, Pavia, Italy
Filed Nov. 29, 1972, Ser. No. 310,472
Claims priority, application Italy May 30, 1972
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1



237,219
NASAL PIECE FOR CONTINUOUS POSITIVE AIRWAY PRESSURE SYSTEM
John Kattwinkel, 2312 Wrenford Road, Cleveland, Ohio 44118; and David G. Fleming, 3714 Atherstone 44121; and Wen H. Ko, 1634 Compton Road 44146, both of Cleveland Heights, Ohio
Filed Mar. 21, 1974, Ser. No. 453,607
Term of patent 14 years
Int. Cl. D24—*02;* D29—*02*
U.S. Cl. D83—1 G

237,220
RESPIRATORY MASK FOR SURGERY
Wyman H. Stackhouse, 3201 Poinsetter Ave., Manhattan Beach, Calif. 90266
Filed Nov. 12, 1973, Ser. No. 414,672
Term of patent 14 years
Int. Cl. D24—*02;* D29—*02*
U.S. Cl. D83—1 K

237,221
BELT MOUNTED MASSAGING DEVICE
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed June 20, 1973, Ser. No. 371,735
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D83—1 S



237,222
BABY SOOTHER
Ronald Keith Moore, Kempsey, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England
Filed June 6, 1974, Ser. No. 477,019
Claims priority, application Great Britain Mar. 27, 1974
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 C

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF OCTOBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.A. Manufacturing: *See*—
Trevathan, Richard B., 3,911,602.

A. Finkl & Sons Company: *See*—
Waid, George M.; and Ault, Robert T., 3,912,553.

A/S Ferrosan: *See*—
Christensen, Jorgen Anders; and Squires, Richard Felt, 3,912,743.

AAI Corporation: *See*—
Barr, Irwin R.; and Brown, Paul L., 3,911,824.

AB Bahco Ventilation: *See*—
Persson, Holger Alexis, 3,912,308.

AB Carbox: *See*—
Adolfsson, Rune G., 3,911,811.

AB Instrument-Verken: *See*—
Nilsson, Karl-Ivar, 3,912,177.

Abbott, Andrew Doyle; and Liston, Thomas V., to Chevron Research Company. Amine and sulfur-containing alkylphenoxides. 3,912,707, Cl. 260-136.000.

Abe, Mitsunobu: *See*—
Gondo, Hisashi; Takechi, Hiroshi; Abe, Mitsunobu; and Namba, Kazuo, 3,912,549.

Abildgaard, William H.; and Groswith, Charles T., III, to Velo-Bind, Inc. Method and apparatus for casing books and product thereof. 3,912,304, Cl. 281-21.000.

Abrams, Richard N. Apparatus for preparing statements. 3,913,118, Cl. 354-292.000.

Abrosimov, Vladimir Alexeevich: *See*—
Boguslavsky, Igor Alexandrovich; Brekhovskikh, Serafin Maximovich; Abrosimov, Vladimir Alexeevich; and Viktorova, Julia Nikolaevna, 3,912,480.

ACF Industries, Incorporated: *See*—
Pfabe, Kort K., 3,912,423.

Acker, Roy M.: *See*—
Williamson, Clyde E.; Acker, Roy M.; Greenbaum, Gilbert A.; and Phillips, William J., 3,913,105.

Acklin, John Ross, to Calgon Corporation. Dispenser for fluent materials and container. 3,912,125, Cl. 222-165.000.

Acme Highway Products Corporation: *See*—
Kerschner, James J., 3,912,286.

Acousa Saxon, S.A., Firma: *See*—
Haussels, Berthold, 3,911,525.

Acro, Inc.: *See*—
Robinson, Mark L., 3,912,268.

Adams, Clarence R. Pneumatic roll stabilizing suspension system. 3,911,830, Cl. 105-164.000.

Adams, Gilbert T.: *See*—
Holland, Gordon A.; and Adams, Gilbert T., 3,912,049.

Adams, John H., to Chevron Research Company. Lubricant containing alkali metal borates and phosphates. 3,912,639, Cl. 252-33.400.

Adams, John H., to Chevron Research Company. Lubricant containing neutralized alkali metal borates. 3,912,643, Cl. 252-49.600.

Adams, John H., to Chevron Research Company. Lubricant containing neutralized potassium borates. 3,912,644, Cl. 252-49.600.

Addressograph Multigraph Corporation: *See*—
Griesmer, Jerome John, 3,911,861.
Kumins, Charles A., 3,912,512.
Westdale, Virgil W., 3,912,645.

Adell, Franklin 3Z. Invert emulsion fire extinguishing composition and method. 3,912,647, Cl. 252-8.050.

Adler, Karl; and Ducommun, Georges, to Biviator S.A. System for safeguarding a device against being operated and used by persons of reduced capacity. 3,913,086, Cl. 340-279.000.

Adolfsson, Rune G., to AB Carbox. Machine frame, especially for presses. 3,911,811, Cl. 100-295.000.

Adrian, Donald J., to United States of America, Navy. Sub-carrier proximity fuze system. 3,913,101, Cl. 343-7.0PF.

Adrian, Donald J.; and Cash, Carlton H., to United States of America, Navy. Incoherent spectral comparison fuze system with hybrid AGC. 3,913,104, Cl. 343-7.0PF.

AEG Elotherm G.m.b.H.: *See*—
Von Starck, Axel, 3,913,045.

Aero Tec Laboratories Inc.: *See*—
Hilden, Noel W.; and Regna, Peter J., 3,911,949.

Aerojet-General Corporation: *See*—
Bereisa, Jonas, Jr., 3,912,993.

Aeronca, Inc.: *See*—
Logsdon, Hillard Glenn, 3,911,958.

Ageev, Leonid Matveevich: *See*—
Vydrin, Vladimir Nikolaevich; Ageev, Leonid Matveevich; Sudakov, Nikolai Vladimirovich; Sosjurko, Vladimir Georgievich; and Trusov, Gennady Evgenievich, 3,911,713.

Agfa-Gevaert, a naamloze vennootschap: *See*—
Janssens, Wilhelmus; Dierckx, Jozef Aime; and Hubert, Hendrik, 3,912,509.
Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, 3,912,517.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bruck, Rolf; and Meister, Kurt, 3,912,186.
Herzhoff, Peter; Gref, Hans; Bruck, Herbert; and Busch, Josef, 3,911,863.
Pfeifer, Josef; and Hofmann, Wilfried, 3,913,119.
Wagensonner, Eduard, 3,912,384.

Agfa-Gevaert N.V.: *See*—
Monbaliu, Marcel Jacob; Benoy, Gaston Jacob; Van Poucke, Raphael Karel; Sauerteig, Wolfgang; Stieler, Dieter; and De Cat, Arthur Henri, 3,912,513.

Ahlgrim, Michael: *See*—
Mietens, Gerhard; and Ahlgrim, Michael, 3,912,603.

Air Preheater Company, Inc., The: *See*—
Theoclitus, Gregory, 3,912,163.

Air Products and Chemicals, Inc.: *See*—
Bechara, Ibrahim Selim; and Holland, Dewey G., 3,912,689.
Collins, Watson R., Jr.; and Kokinda, James J., 3,911,948.
Crump, Gwyn Norman; Bogard, Gary Allen; and Delius, Henry Byron, 3,912,980.

Airco, Inc.: *See*—
Kennedy, Kurt D., 3,912,826.

Aisin Seiki Kabushiki Kaisha: *See*—
Yamanaka, Minoru, 3,912,315.
Yokoi, Masatada; and Tsubouchi, Kaoru, 3,912,051.

Aizawa, Hiroshi: *See*—
Taguchi, Tatsuya; Sugiura, Yoji; Aizawa, Hiroshi; Uchidoi, Masanori; and Iwashita, Tomonori, 3,913,114.

Aizawa, Susumu; Futagawa, Yoshikiyo; and Shindo, Takemasa, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Thermal sensitive printing head. 3,913,091, Cl. 340-324.00R.

Ajinomoto Co., Inc.: *See*—
Enei, Hitoshi; Anzai, Yasuo; Sato, Katsuaki; Eguchi, Hajime; and Hirose, Yoshio, 3,912,587.

Ajus, Camille Albert; and Ajus, Marguerite Nicolas. Apparatus for tracing patterns for the garment industry. 3,911,584, Cl. 33-11.000.

Ajus, Marguerite Nicolas: *See*—
Ajus, Camille Albert; and Ajus, Marguerite Nicolas, 3,911,584.

Akashi, Goro: *See*—
Kitamoto, Tatsuji; Shimizu, Mahito; Fujiyama, Masaaki; and Akashi, Goro, 3,913,131.

Akino, Morio: *See*—
Yagi, Motoi; Akino, Morio; and Takeuchi, Hisaharu, 3,913,144.

Akridge, Albert Neal: *See*—
Bean, Kenneth E.; and Akridge, Albert Neal, 3,911,559.

Akrosil Corporation: *See*—
Kapral, Ales M., 3,912,569.

Aktiebolaget Gyproc: *See*—
Larsson, Lars-Inge Bertil, 3,911,636.

Akune, Mikio; and Yoshii, Kokichi, to Nittetsu Chemical Engineering Co., Ltd. Method and apparatus for treatment of liquid wastes. 3,912,577, Cl. 159-4.00A.

Albert Einstein College of Medicine: *See*—
Seifter, Eli; and Rettura, Giuseppe, 3,911,915.

Albrecht, Cord; and Lamatsch, Hans, to Siemens Aktiengesellschaft. Superconducting magnet with ribbon-shaped conductor. 3,913,044, Cl. 335-216.000.

Albrecht, Francis E., to Bunker Ramo Corporation. Method and apparatus for generating a traveling display. 3,913,089, Cl. 340-324.0AD.

Albright & Wilson Limited: *See*—
Williams, Thomas Alan; and Cussons, Frank Michael, 3,912,803.

Alburger, James R. Water-soluble inspection penetrant composition employing dimethyl naphthalene. 3,912,653, Cl. 252-408.000.

Alburn, Harvey E.; Grant, Norman H.; and Clark, Donald E., to American Home Products Corporation. Treatment of diabetes using somatostatin and insulin. 3,912,807, Cl. 424-178.000.

Alcan Aluminum Corporation: *See*—
Englund, James A.; and Popek, Stephen, 3,911,638.

Alcan Research and Development Limited: *See*—
Veillette, Renald, 3,911,996.

Aldis, Arthur John: *See*—
Harding, Brian; Aldis, Arthur John; and Collins, Kenneth Edmund, 3,912,161.

Alex: *See*—
Alexander, Robert W., 3,913,004.

Alexander, James C., to Quaker Oats Company, The. Toy scoop loader. 3,911,615, Cl. 46-40.000.

Alexander, Robert W., to Alex. Method and apparatus for increasing electrical power. 3,913,004, Cl. 321-28.000.

Alexander, William J., III: *See*—
Bond, Robert W.; and Alexander, William J., III, 3,911,966.

Alferov, Jury Fedorovich: *See*—
Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich, 3,912,847.

Allen, Donald M.: *See—*
Gerbic, Charles C., deceased; Brumm, Richard S.; and Allen, Donald M., 3,911,941.
Allen, George Rodger: *See—*
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Ashton, Stanley; Jones, Gwilym Thomas; Sharma, Vijay Ratna; and Taylor, John Anthony, to Imperial Chemical Industries Limited. Certain N-thio derivatives of thiazolidinones. 3,912,749, Cl. 260-306.70R.

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Bailey, Jay Richard, to McCulloch Corporation. Coaxial vibrating isolation unit for a chain saw including discrete, independently operable elements. 3,911,580, Cl. 30-381.000.

Bailly, Michel. Apparatus for extruding and moulding plastic material. 3,912,436, Cl. 425-327.000.

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Baird, James D., to Schaub Engineering Company. Acoustic antenna. 3,912,954, Cl. 310-9.100.

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Beckel, Frank L. Microscopic field marker. 3,912,360, Cl. 350-92.000.

Becker, Charles J., to American Videonetics Corporation. Film processing apparatus and method for information storage system. 3,912,833, Cl. 427-294.000.

Becker, Kunibert; Holken, Norbert; Plevak, Lubomir; and Wojaczek, Egon, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installations. 3,911,686, Cl. 61-45.00D.

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Becker, Werner; Kistner, Heinz; and Volk, Heinrich, to Dymo Industries, Inc. Device for printing and dispensing labels. 3,911,817, Cl. 101-288.000.

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Berzin, Anna Eduardovna: *See—*
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Bhuta, Pravin G.; Evensen, David A.; and Burchman, Edmund K., to TRW Inc. Optical signature method and apparatus for structural integrity verification. 3,911,733, Cl. 73-88.00A.

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Birnbaum, Bruce H. Refuse compactor and method. 3,911,807, Cl. 100-37.000.

Bischoff, Edelbert; and Hessler, Willy, to Werner & Mertz GmbH. Self-polishing agent for shoes and other leather articles subject to distortion. 3,912,679, Cl. 260-28.50R.

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Blunden, Donald J., to Whitehead & Kales Company. End door for enclosed rail cars. 3,911,831, Cl. 105-378.000.

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Boling, John L., to United States of America, Army. Method of attaching fiber optics bundle to laser squib. 3,911,822, Cl. 102-70.20R.

Bollinger, John G.; and Sandberg, Robert J., to Wisconsin Alumni Research Foundation. Noise quality detector for electric motors or other machines. 3,913,084, Cl. 340-261.000.

Bolner, Thomas E., to Thiokol Corporation. Self actuated pressure lubricated swivelled nozzle for rocket motors. 3,912,172, Cl. 239-265.350.

Bolte, Hans-Eckhard; and Schubert, Klaus-Lothar, to Stannol-Lotmittelfabrik Wilhelm Paff. Flux for soft solders. 3,912,550, Cl. 148-23.000.

Bolton, Floyd G.; and Bolton, Louis A. Tractor lift. 3,912,092, Cl. 214-75.00R.

Bolton, Joseph A., III; and LeBlanc, Peter Edmund, to Bird Machine Company, Inc. Screening machine with lights removal. 3,912,622, Cl. 209-17.000.

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Boonstra, Douwe Johannes; and Bakker, Age, to Scholten-Honig Research B.V. Guar gum derivatives and process for preparation. 3,912,713, Cl. 260-209.00R.

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Boretos, John W., to United States of America, Health, Education, and Welfare. Composite heart valve poppet. 3,911,502, Cl. 3-1.500.

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Botterell, John Joseph; Dayton, Robert Lewis; and Guyler, James Raymond, to American Telephone and Telegraph Company. Conference arrangement. 3,912,874, Cl. 179-18.0BC.

Boucher, Raymond Marcel Gut, to Wave Energy Systems, Inc. Method for synergistic disinfection or sterilization. 3,912,450, Cl. 21-54.00A.

Bous, Karl. Control of yarn tensions. 3,912,184, Cl. 242-47.010.

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Brace, Jack L. Putter head with direction and centering arrow. 3,912,274, Cl. 273-164.000.

Bracke, William J. I., to Labofina S.A. Production of ABS resins. 3,912,794, Cl. 260-880.00R.

Bradbury, Charles, to Hawker Siddeley Aviation Limited. Aircraft. 3,912,201, Cl. 244-23.00D.

Brady, Thomas Eugene; and Loffelman, Frank Fred, to American Cyanamid Company. Ring halogen-free substituted triazine compounds as bleach activators. 3,912,648, Cl. 252-102.000.

Brady, William C.; and Giles, William F., to Owens-Corning Fiberglas Corporation. Apparatus for processing glass batch material. 3,912,477, Cl. 65-1.000.

Brandenburg, John T.; Suggitt, Robert M.; and Liden, Thomas M., to Texaco Inc. Catalyst for conversion of alkylaromatics. 3,912,659, Cl. 252-455.00Z.

Brandt, Jim L.: *See—*
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Branen, Kenneth E., to Avco Corporation. Radome formed of curable billet and wound tape. 3,913,108, Cl. 343-872.000.

Brannan, James N. Pivoted extension ladder. 3,912,043, Cl. 182-23.000.

Braun, Arthur Rechtman; Johnson, Clarence Newton; and Laane, Rein Raymond, to Bell Telephone Laboratories, Incorporated. Electrical communication switching network providing far-end crosstalk reduction. 3,912,877, Cl. 179-80.000.

Braun, Eric A., to Ex-Cell-O Corporation. Carton sealing apparatus. 3,912,576, Cl. 156-580.000.

Braun, Harry J., to Bergstrom Paper Company. Reverse cleaning and de-inking of paper stock. 3,912,579, Cl. 162-4.000.

Brazier, Irvin L., to Milprint, Inc. Flexible packaging film. 3,912,843, Cl. 428-474.000.

Brazier, Peter H. Bailing devices. 3,911,848, Cl. 114-185.000.

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Brembeck, Howard S., to Chore-Time Equipment, Inc. Poultry feeder. 3,911,868, Cl. 119-53.000.

Bremer, Georg Fritz, to Dymo Industries, Inc. Ink printing tool. 3,912,066, Cl. 197-46.000.

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Bright, Edward J., to Bendix Corporation, The. Electrical connector having an internal switch. 3,912,889, Cl. 200-51.100.

Brinker, Harry. Method of dispersing pesticide fluid. 3,911,611, Cl. 43-124.000.

Bristol-Myers Company: *See—*
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British Industrial Plastics Limited: *See—*
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Britz, William J.; and Boshers, William A., to United States of America, General Counsel-Code GP. Rapid activation and checkout device for batteries. 3,912,541, Cl. 136-90.000.

Brizzolara, Donald Francis; and Garrett, Robert Roth, to Du Pont de Nemours, E. I., and Company. Polychloroprene-tackifying resin dispersions. 3,912,676, Cl. 260-27.0BB.

Broder, Jacob D., to United States of America, General Counsel-Code GP. Covered silicon solar cells and method of manufacture. 3,912,540, Cl. 136-89.000.

Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, to BASF Aktiengesellschaft. Catalyst and its use for the manufacture of methane from gases containing carbon monoxide and dioxide and hydrogen. 3,912,775, Cl. 260-449.600.

Broline, Eric N.: *See—*
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Bronfman, Daniel. Boom structure. 3,912,088, Cl. 212-8.00R.

Brooke, Edric Raymond, to Xerox Corporation. Electrostatography. 3,912,387, Cl. 355-3.00R.

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Brown, John Robert: *See—*
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Brown, Kenard D. Incinerator and system for cleaning products of combustion. 3,911,836, Cl. 110-8.00R.

Brown, Paul L., to Dow Corning Corporation. Anhydrous organosilicon fluids. 3,912,651, Cl. 252-78.000.

Brown, Paul L.: *See—*
Barr, Irwin R.; and Brown, Paul L., 3,911,824.

Brown, Reed M., III, to General Motors Corporation. Carburetor with altitude and t-mecs metering control. 3,912,796, Cl. 261-39.00A.

Brown & Root, Inc.: *See—*
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Bruck, Herbert: *See—*
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Bruno, Saverio Thomas; and Sladek, Norbert Joseph, to Bunker Ramo Corporation. High frequency coaxial cable. 3,912,850, Cl. 174-28.000.

Brunswick Corporation: *See—*
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Brunt, Geoffrey Albert Kenyon: *See—*
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Bryan, John F., Jr. Articulated joint for articulated vehicles. 3,912,300, Cl. 280-400.000.

Bryant, Robert G., to GEM Industries, Inc. Two motion safety lock for crib drop sides. 3,911,510, Cl. 5-100.000.

Bryfogle, Kenneth G.; and Bartlett, Gary F., to Poly-Growers, Inc. Gutter structure for holding flexible and non-flexible covers. 3,911,632, Cl. 52-13.000.

Buchanan, John K., to Motorola, Inc. MOS data bus control circuitry. 3,912,947, Cl. 307-269.000.

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Budd Company, The: *See—*
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Bulloch, David K.; and Klein, Ronald A., to Philip A. Hunt Chemical Corporation. Method of regenerating a spent photographic silver bleach solution. 3,912,514, Cl. 96-60.00R.

Bulova Watch Company, Inc.: *See—*
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Bundy, Hugh R.: *See—*
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Bruno, Saverio Thomas; and Sladek, Norbert Joseph, 3,912,850.
Kwan, Okun; and Boyce, James John, 3,912,068.

Bunting, James William, to Courtaulds Engineering Limited. Process control method and apparatus. 3,912,913, Cl. 235-150.100.

Burch, Lyndon W., to B/K Patent Development, Inc. Thermostatic circuit breaker. 3,913,049, Cl. 337-75.000.

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Burdeska, Kurt; and Pugin, Andre, to Ciba-Geigy Corporation. Dioxazine dyestuffs. 3,912,732, Cl. 260-246.00R.

Burgess, James F.; and Neugebauer, Constantine A., to General Electric Company. Method for bonding metal to ceramic. 3,911,553, Cl. 228-173.000.

Burke, Edward F., Jr., to Polaroid Corporation. Photographic apparatus and method for locating film in a precise focal plane. 3,912,381, Cl. 352-72.000.

Burkle, Hermann, to Kienhofer & Moog GmbH KG. Watch construction. 3,911,669, Cl. 58-88.00C.

Burlington Industries, Inc.: *See—*
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Burroughs Corporation: *See—*
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Burson, Bob O., to R. E. Phelon Company, Inc. Capacitor discharge ignition system. 3,911,887, Cl. 123-148.00R.

Burton, Charles G., to Chisholm-Ryder Company, Inc. Machine for harvesting fruit grown on plants arranged in a row. 3,911,653, Cl. 56-330.000.

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Busch, Josef: *See—*
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Buscher, Heinz, to Hoesch Werke Aktiengesellschaft. Method of and apparatus for processing slag, especially furnace slag. 3,912,628, Cl. 210-75.000.

Busey, Harold M., to United States of America, Energy Research and Development Administration. Method for utilizing decay heat from radioactive nuclear wastes. 3,911,684, Cl. 60-644.000.

Bush, Roy E., to Continental Oil Company. Method for removing plastic from the inside diameter of wellbore casing. 3,912,012, Cl. 166-285.000.

Busse, Fritz; Busch, Hans-Walter; and Dungs, Gunter, to Bremshey Aktiengesellschaft, Firma. Gymnastic apparatus. 3,912,264, Cl. 272-72.000.

Butler Automatic, Inc.: *See*—
Meihofer, Edward F., 3,912,145.

Butler, Claud D.: *See*—
Clark, Charles R.; Gregory, M. Duane; Krehbiel, Delmar D.; Butler, Claud D.; and Kennedy, Carl D., 3,912,010.

Butler, Gene R.: *See*—
Darnall, David L.; Butler, Gene R.; Butler, Lee D.; and Barton, Lester C., 3,911,654.

Butler, Lee D.: *See*—
Darnall, David L.; Butler, Gene R.; Butler, Lee D.; and Barton, Lester C., 3,911,654.

Butler Manufacturing Company: *See*—
Pondell, Stan A., 3,912,090.

Butternut Corporation: *See*—
Hartig, John W., Jr.; and Showalter, Casper W., 3,912,179.

Buturuga, John. Attachable pencil holder for paper retaining clamp. 3,911,531, Cl. 24-10.000.

Buza, Thomas Brian; and Kuhn, Martin Clifford, to Anaconda Company, The. Flotation recovery of molybdenum. 3,912,623, Cl. 209-167.000.

Bykovets, Konstantin Petrovich: *See*—
Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; Bykovets, Konstantin Petrovich; and Zavodyan, Vitaly Voitsekhovich, 3,911,859.

C.A.V. Limited: *See*—
Stefanek, Karel, 3,911,939.
Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, 3,911,883.

C. Jim Stewart & Stevenson, Inc.: *See*—
Calhoun, Charles W., 3,911,740.

Cabax Mills: *See*—
Woodruff, Curtis H., 3,912,254.

Calgon Corporation: *See*—
Acklin, John Ross, 3,912,125.

Calhoun, Charles W., to C. Jim Stewart & Stevenson, Inc. Method of and apparatus for measuring properties of drilling mud in an underwater well. 3,911,740, Cl. 73-153.000.

California Computer Products, Inc.: *See*—
Collins, Gary W.; and Klang, Daniel M., 3,913,141.

California Institute of Technology: *See*—
Arnett, James C., 3,912,900.
England, Christopher, 3,912,999.

California Pellet Mill Company: *See*—
Gilman, Robert W., 3,911,550.

Call, Daniel D., to Bacom, Incorporated. Sensing switch having resilient finger sensor for detecting a document. 3,912,890, Cl. 200-61.410.

Callan, John E., to Cities Service Oil Company. Pelletized semi-vulcanized butyl rubber. 3,912,684, Cl. 260-33.6AQ.

Callens, Paul Raymond, to International Business Machines Corporation. Data transmission process. 3,912,872, Cl. 179-15.0BA.

Calvaer, Albert J., to Knox, Inc. Web position detector apparatus. 3,912,193, Cl. 242-57.100.

Campbell, Donald S.; and Stephan, Edward A., to Minnesota Mining and Manufacturing Company. Ground connector for shielded cable. 3,912,354, Cl. 339-99.00R.

Canavespe, Joseph A.: *See*—
Seibel, Charles M.; and Canavespe, Joseph A., 3,912,199.

Canazzi, H. Donald. Boat steering propulsion system. 3,911,851, Cl. 115-12.00R.

Candy, James Charles, to Bell Telephone Laboratories, Incorporated. Circuit for curtailing effects of bit errors in pulse coded transmission. 3,913,016, Cl. 325-38.00B.

Cannon, Thomas G.: *See*—
Mullins, Keith M.; Smith, David W.; and Cannon, Thomas G., 3,912,168.

Canon, Jack Y. Bullet. 3,911,820, Cl. 102-38.000.

Canon Kabushiki Kaisha: *See*—
Endo, Ichiro; Matsuno, Hiroshi; Kokado, Hiroshi; Inoue, Eiichi; Nishide, Katsuhiko; and Kinjo, Kikuo, 3,912,844.
Miyamoto, Koichi, 3,912,389.
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Taguchi, Tatsuya; Sugiura, Yoji; Aizawa, Hiroshi; Uchidoi, Masanori; and Iwashita, Tomonori, 3,913,114.
Takahashi, Isao; Fujii, Motoharu; Kawakubo, Kazuo; Ariga, Masao; and Sugiura, Susumu, 3,912,388.

Canron, Inc.: *See*—
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Cantz, Rudolf, to Kennametal Inc. Anti-skid element for a vehicle tire. 3,911,986, Cl. 152-210.000.

Capistiano, Hideo Watanabe: *See*—
Spracklen, Stanford B.; and Capistiano, Hideo Watanabe, 3,912,614.

Cardwell, Gilbert I., Jr., to Hughes Aircraft Company. Two-phase solid state power converter. 3,913,000, Cl. 321-2.000.

Carletti, Vittorio: *See*—
Alneri, Enzo; Bottaccio, Giorgio; Carletti, Vittorio; and Lana, Giulio, 3,912,778.

Carnahan, Thomas G.; and Heinen, Harold J., to United States of America, Interior. Chemical mining of copper porphyry ores. 3,912,330, Cl. 299-4.000.

Carpenter, Emerl R., to American Hoist & Derrick Company. Hydraulic support for cylinder of piston cylinder motor. 3,912,096, Cl. 214-138.00R.

Carr, George W. Trailer swing away step. 3,912,299, Cl. 280-166.000.

Carrier Corporation: *See*—
Greeley, Edward M., 3,912,453.

Carter, George William; and Hilliker, Stephen Earl, to RCA Corporation. Electromagnetic radiation filter for coaxially fed hot chassis television receiver. 3,913,038, Cl. 333-70.00R.

Carter's Ink Company, The: *See*—
Haeberle, Robert W.; Lennon, Donald J. J.; and Schleifstein, Harvey G., 3,913,110.

Carvell, Bernard J.; Sandford, W. Nelson; and Zimmerman, C. Michael. Deadlock for sliding doors. 3,912,311, Cl. 292-216.000.

Case, Forrest N.; and Ketchen, Eugene E., to United States of America, Energy Research and Development Administration. Method for removing and decolorizing aqueous waste effluents containing dissolved or dispersed organic matter. 3,912,625, Cl. 210-30.000.

Casey, Donald James; and Epstein, Martin, to American Cyanamid Company. Process for polymerizing a substantially pure glycolide composition. 3,912,692, Cl. 260-78.30R.

Cash, Carlton H., to United States of America, Navy. Device for range cut-off by frequency selection in multiple modulation fuzes. 3,913,103, Cl. 343-7.0PF.

Cash, Carlton H.: *See*—
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Casio Computer Co., Ltd.: *See*—
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Caspari, Fred W.; and Johnson, Wayne C., to Magnavox Company, The. Electronic automatic frequency tuning system. 3,913,029, Cl. 331-4.000.

Cassella Farbwerke Mainkur AG: *See*—
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Heinrich, Ernst; and Muller, Rolf, 3,912,744.
Heinrich, Ernst; and Muller, Rolf, 3,912,745.
Ribka, Joachim; Piesch, Steffen; and Engelhardt, Friedrich, 3,912,780.

Casteline, Peter, Jr., to Cities Service Oil Company. Fuel vapor seal device. 3,911,973, Cl. 141-59.000.

Casten, James W., to Envirotech Corporation. Method for solidifying smelt. 3,912,580, Cl. 162-30.000.

Castle, Paul: *See*—
Gosling, Alexander Bennett; Smith, Colin Howard Stanwell; and Castle, Paul, 3,912,284.

Castoe, John H. Nut splitting tool. 3,911,576, Cl. 30-189.000.

Castoe, John H., to Applied Power, Inc. Spring compressor. 3,912,224, Cl. 254-10.500.

Caterpillar Tractor Company: *See*—
Caudill, Maurice L.; Cochran, Steven C.; and Loebach, Donald C., 3,911,993.
Hammond, James T., 3,911,885.
Mitsuishi, Yoshiji; and Uchida, Tomio, 3,912,297.
Ritter, Arthur J., Jr.; and Perry, David L., 3,912,336.
Turner, Leland D.; and Zimmerman, William H., 3,912,097.

Catt, Ivor. Digital integrated circuits. 3,913,072, Cl. 340-172.500.

Caudill, Maurice L.; Cochran, Steven C.; and Loebach, Donald C., to Caterpillar Tractor Company. Method and apparatus for adding treating agents to molten metal. 3,911,993, Cl. 164-55.000.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Ltd. 1-(Benzo[b]thienylalkyl)piperidines. 3,912,741, Cl. 260-293.570.

Cayzer, Ian; and Pitcher, Pamela Mary, to Burroughs Wellcome Co. Reagent and assay for human fibrinogen degradation products. 3,912,805, Cl. 424-12.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Baumann, Bernard, 3,912,107.

Celamerck GmbH & Co. KG: *See*—
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,912,738.

Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See*—
Gaucher, Antoine; and Guilhot, Gerard, 3,912,547.

Cerutti, Piero. Locking system for container doors and the like. 3,912,312, Cl. 292-218.000.

Chahley, William, to Wm. Chahley Ltd. Tamper-resisting screw-threaded plug. 3,912,116, Cl. 220-288.000.

Champion Company, The: *See*—
Rendon, Leandro, 3,912,809.

Chan, John Y. S. Tape cassette with tape clearance space. 3,912,194, Cl. 242-199.000.

Chandler, James F.; Chiodi, Wayne R.; Figlewicz, Raymond C.; and Karlovics, Steven, to Zenith Radio Corporation. Electron beam deflection correction system. 3,912,970, Cl. 315-370.000.

Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., to Quaker Oats Company, The. The process for producing modified protein. 3,912,818, Cl. 426-44.000.

Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of a casein substitute. 3,912,819, Cl. 426-44.000.

Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P. Process for the production of a casein substitute. 3,912,820, Cl. 426-44.000.

Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., to Quaker Oats Company, The. Process for producing liquid modified protein. 3,912,821, Cl. 426-44.000.
Chang, Wen-Hsuan; and Hartman, Marvis E., to PPG Industries, Inc. Compositions for producing extensible coatings. 3,912,790, Cl. 260-849.000.
Chang, Yi-Chung, to Berry Metal Company. Apparatus and process for refining hot metal to steel. 3,912,243, Cl. 266-34.0LM.
Chang, Yi-Chung, to Berry Metal Company. Apparatus for oxygen-lancing a metallurgical bath. 3,912,244, Cl. 266-34.00L.
Charboneau, Benny J.; and Nielsen, Paul I., to Walbro Corporation. Catalytic heater. 3,911,896, Cl. 126-350.00A.
Charles, Christiane, administrator: *See—*
Coiffier, Maurice; and Montaron, Andre, deceased, 3,912,499.
Chatten, Victor H. Ornamental device having lines for gravity descent of liquid droplets. 3,912,166, Cl. 239-20.000.
Chemetron Corporation: *See—*
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ChemLab Manufacturing Limited: *See—*
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Cheng, Chia-Chung: *See—*
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Sanford, Steve Douglas; Chenoweth, Vaughn Charles; and Faulkner, Duane Harold, 3,912,488.
Cherin, Allen Henry; and Rich, Philip Jay, to Bell Telephone Laboratories, Incorporated. Apparatus for splicing pairs of arrayed or individual fibers utilizing optical fiber aligning grooves. 3,912,574, Cl. 156-502.000.
Cherne Industrial, Inc.: *See—*
Boler, Leonard J.; Beaulieu, Bryan J.; Stoesz, Leander J.; and Desnick, Mandel L., 3,912,797.
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Chevron Research Company: *See—*
Abbott, Andrew Doyle; and Liston, Thomas V., 3,912,707.
Adams, John H., 3,912,639.
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Kozlowski, Robert H.; Sieg, Robert P.; and Scott, John W., 3,912,463.
Suzuki, Shigeto, 3,912,784.
Suzuki, Shigeto, 3,912,785.
Chiappe, Jorge A.; and Bianco, Hercules C. A. B., to Dominguez, Loreto M., a part interest. Mechanical dolls which are controlled by signals on a recording medium. 3,912,694, Cl. 360-79.000.
Chiba, Ko; and Maruyama, Masayuki, to Nissan Motor Company Limited; and Riken Piston Ring Kogyo Kabushiki Kaisha. Shaft seal. 3,912,428, Cl. 418-104.000.
Chiba, Tsuneyo: *See—*
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Chicago Pneumatic Tool Company: *See—*
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Chiodi, Wayne R.: *See—*
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Chisholm, Douglas S., to Dow Chemical Company, The. Centrifugal extrusion employing eddy currents. 3,912,799, Cl. 264-25.000.
Chisholm-Ryder Company, Inc.: *See—*
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Chiusoli, Gian Paolo: *See—*
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Chloride Legg Limited: *See—*
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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Benzodioxane derivatives. 3,912,759, Cl. 260-340.300.
Chomat, Max; and Proriol, Jacques, to Rhone-Poulenc S.A. Fire-resistant flexible tubes. 3,911,962, Cl. 138-125.000.
Chore-Time Equipment, Inc.: *See—*
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Christensen, Jorgen Anders; and Squires, Richard Felt, to A/S Ferrosan. 4-Phenylpiperidine compounds. 3,912,743, Cl. 260-293.580.
Christopherson, Rodger L., to Philco-Ford Corporation (Now Aeronutronic Ford Corporation). Electronic tracking device. 3,912,859, Cl. 178-6.800.
Christy, Charles B.; and Zunkel, Richard L., to Eaton Corporation. Door closer assembly and self-aligning stop. 3,911,526, Cl. 16-49.000.
Chun, Joong Hee; and Shaw, Bernard L. Method and apparatus for collection of newspapers for recycling. 3,912,047, Cl. 186-1.00R.
Chupp, John Paul, to Monsanto Company. Tetrahydrothioquinazolinones. 3,912,492, Cl. 71-76.000.
Ciba-Geigy AG: *See—*
Peter, Richard; and Angliker, Hans-Joerg, 3,912,712.
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Burdeska, Kurt; and Pugin, Andre, 3,912,732.
Foery, Werner; and Fischer, Hans Peter, 3,912,493.
Model, Ernst; von der Crone, Jost; and Pugin, Andre, 3,912,710.
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Zondler, Helmut; and Pfleiderer, Wolfgang, 3,912,762.
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Cities Service Oil Company: *See—*
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Roth, Shirley H., 3,912,845.
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Claflin, Warren E.: *See—*
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Clark, Charles R.; Gregory, M. Duane; Krehbiel, Delmar D.; Butler, Claud D.; and Kennedy, Carl D., to Continental Oil Company. Over-based branched chain aliphatic sulfonate waterflood. 3,912,010, Cl. 166-270.000.
Clark, David L.; and Kress, Tommy S., to United States of America, Energy Research and Development Administration. Electric cartridge-type heater for producing a given non-uniform axial power distribution. 3,912,908, Cl. 219-553.000.
Clark, Donald E.: *See—*
Alburn, Harvey E.; Grant, Norman H.; and Clark, Donald E., 3,912,807.
Clark, Norman Owen, to English Clays Lovering Pochin & Company Limited. Refractories. 3,912,526, Cl. 106-55.000.
Clark, Oran: *See—*
McIntire, Daryl C.; and Clark, Oran, 3,911,594.
Clayton, Dennis Albert; and Foster, George William, to Chloride Legg Limited. Automatic electric battery charging apparatus. 3,912,108, Cl. 320-39.000.
Clerk, Robert Cecil. Swash-plate drive for axial piston pumps/motors. 3,911,791, Cl. 91-499.000.
Cline, Carl F.; and Patterson, David A., to Creative Crystals, Inc. Synthetic crystal and method of making same. 3,912,521, Cl. 106-42.000.
Cloup, Jean. Drilling and boring heads. 3,912,021, Cl. 173-46.000.
Cluphf, Harlan E.: *See—*
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Cobb, Carolus M.; and Annis, Martin, to American Science & Engineering, Inc. Cell-by-cell condition detecting. 3,912,929, Cl. 250-303.000.
Cochran, Steven C.: *See—*
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Coflexip: *See—*
Behar, Isaac; and Genini, Maurice, 3,911,688.
Coiffier, Maurice; and Montaron, Andre, deceased (by Charles, Christiane, administrator), to Compagnie Generale d'Electrolyse du Palais. Process for obtaining metals from ores or concentrates. 3,912,499, Cl. 75-3.000.
Colapinto, Fabio. Drying oven for printed sheets. 3,911,593, Cl. 34-55.000.
Colbert, Otto F.: *See—*
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Coleman, Michael G.: *See—*
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Colgate-Palmolive Company: *See—*
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Colinet, Rene D., to Industrial Research Laboratory Inc. Apparatus to suppress noise in gearing. 3,911,756, Cl. 74-410.000.
Collins, Gary W.; and Klang, Daniel M., to California Computer Products, Inc. Head azimuth positioning method using newton's rings. 3,913,141, Cl. 360-109.000.
Collins, George T., to British Industrial Plastics Limited. Injection moulding machines. 3,911,677, Cl. 60-368.000.
Collins, H. Dale, to Holosonics, Inc. Shear wave acoustical holography. 3,911,729, Cl. 73-67.50H.
Collins, Kenneth Edmund: *See—*
Harding, Brian; Aldis, Arthur John; and Collins, Kenneth Edmund, 3,912,161.
Collins, Watson R., Jr.; and Kokinda, James J., to Air Products and Chemicals, Inc. Pressure regulator. 3,911,948, Cl. 137-505.420.
Colquhoun, Joseph A., to Dow Corning Corporation. Defoaming composition useful in jet dyeing. 3,912,652, Cl. 252-358.000.

Columbia Scientific Industries Corporation: *See—*
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Communal, Jean Pierre; Fritz, Jacques; and Papillon, Bernard, to Rhone-Progil. Process for obtaining high molecular weight water-soluble acrylic polymers and copolymers using radiation. 3,912,607, Cl. 204-159.230.

Compagnie Generale d'Electrolyse du Palais: *See—*
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Concord Laboratories: *See—*
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Conflow Irrigation Systems: *See—*
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Connors, David G.; and Singh, Harkrishan, to Ford Motor Company. Seat belt assembly. 3,912,329, Cl. 297-389.000.

Container Corporation of America: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
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Clark, Charles R.; Gregory, M. Duane; Krehbiel, Delmar D.; Butler, Claud D.; and Kennedy, Carl D., 3,912,010.
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Cook, Thomas H., to Inductotherm Corporation. Frequency multiplier circuit for controlling harmonic currents. 3,913,005, Cl. 321-68.000.

Cooke, Ralph C.; and McIntyre, Jefferson A., Jr., to General Electric Company. Household refrigerator shelf. 3,912,085, Cl. 211-153.000.

Cookson, Alan H.: *See—*
Sletten, Andreas M.; and Cookson, Alan H., 3,911,937.

Cooper, Richard F. Inflatable building structure. 3,911,631, Cl. 52-2.000.

Coppens, Johannes Hendrikus: *See—*
Vrijssen, Gerardus Arnoldus Herman Maria; Stoffels, Jacobus; and Coppens, Johannes Hendrikus, 3,912,851.

Corbin, Lucien: *See—*
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Corning Glass Works: *See—*
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Cote, Paul T., to General Electric Company. Connector for photoflash array. 3,912,442, Cl. 431-95.000.

Cotte, Dietrich; Scheffler, Holger; and Kertzscher, Claus, to VEB Wirkmaschinenbau Karl-Marx-Stadt. Pattern device for circular knitting machines. 3,911,697, Cl. 66-50.00B.

Cotton, Worth, Jr., to Industrial Air, Inc. High velocity moisture eliminator. 3,912,471, Cl. 55-440.000.

Couchman, Richard: *See—*
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Coulbourn, Charles, to Los Angeles Scientific Instrument Co., Inc. Opto-electronic incremental encoder. 3,912,926, Cl. 250-231.0SE.

Courtaulds Engineering Limited: *See—*
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Crabtree, Michael: *See—*
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Crase, Gary Monroe: *See—*
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Crask, Geoffrey J., to Hydril Company. Tilt detector and system. 3,911,592, Cl. 33-378.000.

Crawford, Joe W.: *See—*
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Creative Crystals, Inc.: *See—*
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Creedon, John Michael; and Putnam, Sidney Darwin, to Physics International Company. Electron beam focusing system. 3,912,930, Cl. 250-398.000.

Crisp, David John; and Brown, John Robert, to Rizla Limited. Manual cigarette rolling machines. 3,911,933, Cl. 131-47.000.

Crisplant A/S: *See—*
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Crombie, Allen P.; and Steege, Roy M., to Northwest Engineering Service, Inc. Three-plenum mixing dampers. 3,911,953, Cl. 137-595.000.

Cronin, Michael J.; and Taber, Bruce D., to General Electric Company. Automatic rollover marine turbine control. 3,911,685, Cl. 60-706.000.

Cronk, Vern V.; Illikman, John A.; and Gendron, Roger J., to Baker Perkins, Inc. Tray handling apparatus. 3,912,070, Cl. 198-35.000.

Crooij, Pierre; and Colinet, Alain, to Recherche et Industrie Therapeutiques. 7-(3-Substituted ureido and -thioureido) cephalosporins. 3,912,728, Cl. 260-243.00C.

Crosswy, Frank L.: *See—*
Kalb, Henry T.; Crosswy, Frank L.; McClure, Jim A.; Harding, Edward B.; McClure, Billy J.; and Inglish, Donnie J., 3,912,915.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Subsurface well bore shifting tool. 3,912,008, Cl. 166-212.000.

Crowe, Talmadge L.; Chenoweth, David V.; and McStravick, David M., to Baker Oil Tools, Inc. Fluid pressure locked well drilling tool. 3,912,026, Cl. 175-297.000.

Crown Zellerbach Corporation: *See—*
Hartbauer, Ellsworth A.; and Rehr, Henry W., 3,912,571.

Crump, Gwyn Norman; Bogard, Gary Allen; and Delius, Henry Byron, to Air Products and Chemicals, Inc. Direct current arc power supply. 3,912,980, Cl. 317-31.000.

Cryogenic Recycling International Inc.: *See—*
Kisielewski, Robert, 3,911,772.

Culver, Larry Fred: *See—*
Hammond, Robert James; Miller, Carl Wayne; and Culver, Larry Fred, 3,912,283.

Cunninghame, Andrew Lees; and Wagner, Howard Grady, to Machlett Laboratories, Inc., The. X-ray image intensifier system. 3,912,936, Cl. 250-512.000.

Curado, Leonard L.; Greshel, Leonard J.; and Sorensen, Paul A., to TRW Inc. Plug and socket connections. 3,912,355, Cl. 339-128.000.

Curtis, Phyllis M.: *See—*
Lane, George C.; Curtis, Phyllis M.; and Michael, Arthur E., 3,911,579.

Cussons, Frank Michael: *See—*
Williams, Thomas Alan; and Cussons, Frank Michael, 3,912,803.

Cylpik, Incorporated: *See—*
Van Schoyck, Quentin H., 3,911,895.

Czajkowski, Edward H., Jr. Vehicle level control. 3,912,289, Cl. 280-6.100.

Czerner, Peter A.; Daniels, John F.; Ihasz, Richard; and Szymansky, Edward, to Sperry Rand Corporation. Trimmer device for an electric dry shaver. 3,911,572, Cl. 30-34.100.

Czumber, Frank E.: *See—*
Wiltshire, Arthur J.; Ranallo, Henry U.; and Czumber, Frank E., 3,911,965.

D. B. Enterprises, Inc.: *See—*
Engh, Duncan C., 3,912,318.

Daempa A/S: *See—*
Fischer, Jean Arnold; and Fynbo, Knud Hansen, 3,912,309.

Daimler-Benz Aktiengesellschaft: *See—*
Altmann, Werner, 3,911,879.
Kehry, Manfred; and Pospiech, Manfred, 3,913,066.
Stolz, Albert, 3,911,801.

Damlamian, Jean J. Analog and digital tape recorder incorporating legend displaying means. 3,913,135, Cl. 360-79.000.

Damon Corporation: *See—*
Sodickson, Lester A.; and Mickiewicz, Stanley P., 3,912,452.

Dancik, Robert R. Protective cover for cabover camper. 3,912,323, Cl. 296-23.0MC.

Daniels, David A., to W. R. Grace & Co. Preparation of phenothiazines. 3,912,727, Cl. 260-243.00A.

Daniels, John F.: *See—*
Czerner, Peter A.; Daniels, John F.; Ihasz, Richard; and Szymansky, Edward, 3,911,572.

Danko, George K., to General Electric Company. Halogen lamp with internal molybdenum parts. 3,912,960, Cl. 313-222.000.

Danville, David R., to Lever Brothers Company. One-piece case divider. 3,912,159, Cl. 229-42.000.

Dargan, Ervin E.: *See—*
Ervin, Evander M.; and Dargan, Ervin E., 3,911,982.

Darm, William J. Heat exchanger apparatus with spacer projections between plates. 3,912,004, Cl. 165-166.000.

Darnall, David L.; Butler, Gene R.; Butler, Lee D.; and Barton, Lester C., to Sperry Rand Corporation. Machine for forming a compact stack of crop material. 3,911,654, Cl. 56-350.000.

Darskus, Rolf: *See—*
Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, 3,912,738.

Dart Industries Inc.: *See—*
Dunn, George Harvey, Jr., 3,912,701.
Pierce, Joseph E., 3,911,556.
Pierce, Joseph E., 3,911,557.

Dassler, Adolf. Exchangeable gripper element. 3,911,600, Cl. 36-67.00D.

Data Products Corporation: *See—*
Helms, Clifford J.; Skinner, Donald K.; and Stupeck, Donald G., 3,911,814.

Dates, Harold F.: *See—*
Bartholomew, Roger F.; Dates, Harold F.; Stookey, Stanley D.; and Tarcza, Walter H., 3,912,481.

Daub, Rudolph. Connecting rod and connecting rod systems for internal combustion engine and compressors and partitioned cylinder for internal combustion engine. 3,911,753, Cl. 74-40.000.

Daugherty, Raymond Preston, Jr.: *See—*
Magee, John Storey, Jr.; and Daugherty, Raymond Preston, Jr., 3,912,619.

Dave, Sharad M. Variable internal combustion engine valve operating system. 3,911,873, Cl. 123-32.0ST.

Davies, Robert William, to Molins Limited. Cigarette packing machine. 3,911,643, Cl. 53-170.000.

Davis, Claude A.; and Stendig, Joseph L. Condition responsive systems. 3,913,046, Cl. 337-13.000.

Davis, Harry G.: *See—*
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terence P., 3,912,810.

Davis, Murray W. Method and apparatus for forming metal. 3,911,706, Cl. 72-56.000.

Davis, Philip E., Jr. Latch-in adapter. 3,912,009, Cl. 166-240.000.

Davis, Robert A., to Xerox Corporation. Pusher linkage, inserter. 3,911,517, Cl. 11-1.00R.

Davis, Thomas John; and Jannette, Daniel Anthony, to General Motors Corporation. Instrument panel pad with integral duct seal. 3,912,036, Cl. 180-90.000.

Dawes, John L., to Eastman Kodak Company. Process for the purification of pivalolactone. 3,912,599, Cl. 203-61.000.

Dayco Corporation: *See—*
Rush, James B.; and Logan, Arthur D., 3,912,928.

Dayton, Robert Lewis: *See—*
Botterell, John Joseph; Dayton, Robert Lewis; and Guyler, James Raymond, 3,912,874.

Dean, Sheldon W.: *See—*
Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., 3,911,819.

de Bruyn, Henri Arnold, to Slide-O-Sell (Proprietary) Limited. Storage and display of goods. 3,912,086, Cl. 211-162.000.

De Castejon, Javier Gonzalez. Method for the production of iron and steel. 3,912,501, Cl. 75-11.000.

De Cat, Arthur Henri: *See—*
Monbaliu, Marcel Jacob; Benoy, Gaston Jacob; Van Poucke, Raphael Karel; Sauerteig, Wolfgang; Stieler, Dieter; and De Cat, Arthur Henri, 3,912,513.

Decca Limited: *See—*
Gosling, Alexander Bennett; Smith, Colin Howard Stanwell; and Castle, Paul, 3,912,284.

Dedolph, Richard R., to Gravi-Mechanics Co. Seed sprouter and insert therefor. 3,911,619, Cl. 47-14.000.

Deere & Company: *See—*
Hanser, Paul Edmund; and Gebauer, Thomas Edward, 3,911,758.
Krouse, Wayne Lauron; and Miller, James Anton, 3,912,057.
Rehn, Gary Allen, 3,912,017.

Deeter, Ronald C.; and Lora, Thad A., to Salem Tool Company, The. Multiple cutting head assembly for auger mining machine. 3,912,025, Cl. 175-91.000.

Degenhardt, David; and Nelson, Fred, to Ragsdale Brothers Inc. High speed ejector mechanism. 3,911,719, Cl. 72-345.000.

Degobert, Paul; Kermarrec, Francois; and Nadaud, Yvon, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for recovering polluting products spread over the water surface, in particular oil products. 3,912,635, Cl. 210-242.000.

Deguchi, Masahiro; and Hashirano, Masaru, to Matsushita Electric Industrial Co., Ltd. Method for recording control signal on master tape in contact video tape printer. 3,913,132, Cl. 360-17.000.

DeJager, Donald, to Eastman Kodak Company. Three element objective lens having asphoric surfaces on the middle element. 3,912,379, Cl. 350-226.000.

Delahunt, Robert M., to Polaroid Corporation. Planar battery and a photographic film assembly. 3,912,543, Cl. 136-111.000.

Delalande S.A.: *See—*
Huguet, Gerard J.; Fauran, Claude P.; Douzon, Colette A.; Raynaud, Guy M.; and Thomas, Janine M., 3,912,747.

De Lancey, Warren H., to Pioneer Products Company. Centrifugal clutch. 3,912,059, Cl. 192-105.0CD.

Delaney, Arthur. Oil filter with pull tab drain. 3,912,633, Cl. 210-168.000.

Delius, Henry Byron: *See—*
Crump, Gwyn Norman; Bogard, Gary Allen; and Delius, Henry Byron, 3,912,980.

Delkor Industries, Inc.: *See—*
Klund, Robert N., 3,911,799.

Dell, Charles C.; Harms, A. D., Jr.; Knowles, Albert B.; Meredith, Fred D.; and Sutherland, Spurgeon, to LTV Aerospace Corporation. Tracking system. 3,912,198, Cl. 244-3.160.

Della-Porta, Clifford, to Premier Drum Company Limited, The. Musical drums. 3,911,779, Cl. 84-411.000.

Delpretti, Roger: *See—*
Lehmann, Hans; Girardin, Roger; Morf, William; and Delpretti, Roger, 3,912,899.

Delpy, David Thomas, to National Research Development Corporation. Catheter pressure transducer. 3,911,902, Cl. 128-2.05D.

Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, to Ayerst, McKenna and Harrison Ltd. Oxazinoindole- and thiazinoindole derivatives. 3,912,729, Cl. 260-243.00R.

Den Hollander, Charles William; Leimgruber, Willy; and Mohacsi, Ernest, to Hoffmann-La Roche Inc. (-)-Di-O-isopropylidene-2-keto-L-gulonates. 3,912,761, Cl. 260-340.900.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Horiie, Shigeki; Asai, Shin-ichiro; Moriya, Yoshihisa; and Saito, Chiaki, 3,912,793.
Kondo, Renichi; Nakagawa, Koji; Fukuda, Makoto; Okai, Hiroshi; and Kishi, Ikuji, 3,912,671.

Denoor, Gaston; and Ransford, Geoffrey David, to B.V.S.; and Foundation of Canada Engineering Corporation Ltd. Method of manufacture of an elongated enclosure of revolution. 3,911,963, Cl. 138-140.000.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Isoxazolopyridine carboxylic acids and esters. 3,912,737, Cl. 260-268.0BC.

Designs for Vision, Inc.: *See—*
Feinbloom, Richard E., 3,912,918.

Desnick, Mandel L.: *See—*
Boler, Leonard J.; Beaulieu, Bryan J.; Stoesz, Leander J.; and Desnick, Mandel L., 3,912,797.

De Stefano, Leonard A.; and Nimlowycz, Osyp, to United States of America, Army. Rocket catapult aircraft escape arrangement. 3,912,203, Cl. 244-122.0AD.

Dethlefsen, Winfried: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,912,775.

Detprotector, Inc.: *See—*
Sons, James E.; and Starnes, Wayne C., 3,912,976.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Isaac, Otto, 3,912,716.
Rohm, Fritz; and Strahle, Heinz, 3,911,582.

De Vincentiis, Girolamo; Dogliotti, Renato; and Luvison, Angelo, to SCELT Centro Studi e Laboratori Telecomunicazioni. Method of and means for transcoding binary pulses. 3,913,093, Cl. 340-347.0DD.

Dews, George H.; and Kemp, Fred S., to United Technologies Corporation. Novel composite fuel cell electrode. 3,912,538, Cl. 136-86.00D.

Diamond Die & Mold Co.: *See—*
Baldyga, Joseph W., 3,911,721.

Diassi, Patrick Andrew; and Atwal, Manmohan Singh, to E. R. Squibb & Sons, Inc. Process for the preparation of 7-(D-2-amino-2-(1,4-cyclo-hexadienyl) acetamido) desacetoxycephalosporanic acid and 7-(D-2-amino-2-(1,4-cyclohexadienyl) acetamido) cephalosporanic acid. 3,912,726, Cl. 260-243.00C.

Dick, H. Douglas. Waste management system. 3,912,598, Cl. 202-185.000.

Dickey-john Corporation: *See—*
Steffen, Ronald W., 3,912,121.

Dickson, Robert E., to Colgate-Palmolive Company. Composition for imparting non-permanent soil-release characteristics comprising an aqueous acidic solution of polycarboxylate polymer. 3,912,681, Cl. 260-29.60H.

Di Crispino, Joseph S., to United States of America, Navy. Pressure test vessel which allows unrestrained flexing of spherical segment test specimen. 3,911,735, Cl. 73-102.000.

Didycz, William J.; and Glassman, Donald, to United States Steel Corporation. Apparatus for and a method of purifying waste fluid. 3,912,578, Cl. 159-20.00R.

Dierckx, Jozef Aime: *See—*
Janssens, Wilhelmus; Dierckx, Jozef Aime; and Hubert, Hendrik, 3,912,509.

Dietz, Earl D., to Owens-Illinois, Inc. Tooth filling and facing composition comprising a radiopaque glass and method of using the same. 3,911,581, Cl. 32-15.000.

DiFrancia, Ronald E.: *See—*
Hull, Charles R.; Heikes, George E., Jr.; MacBeth, Maurice W.; DiFrancia, Ronald E.; Henderson, Claude L.; and Cluphf, Harlan E., 3,911,796.

Digitron AG: *See—*
Krieg, Walter, 3,912,037.

Di Matteo, Paul L., to Dynell Electronics Corporation. Facial wrinkle remover. 3,911,909, Cl. 128-76.00B.

Dixieco, Inc.: *See—*
Wetzel, Rodney J., 3,912,014.

Dlugos, Daniel F., to Pitney-Bowes, Inc. Photodetector compensating circuit for a postage metering system. 3,913,095, Cl. 340-347.00P.

Dmitriev, Mikhail Eremeevich: *See—*
Vereschagin, Leonid Fedorovich; Semerchian, Aik Akopovich; Modenov, Vitaly Pavlovich; Bocharova, Tamara Timofeevna; and Dmitriev, Mikhail Eremeevich, 3,912,500.

Doan, Robert B.; Taylor, Robert C.; and Reynolds, Max H., to Atlantic Richfield Company. Additives to improve frothing agents in gypsum board manufacture. 3,912,528, Cl. 106-111.000.

Dobinson, Bryan: *See—*
Andrews, Christopher Michael; Dobinson, Bryan; Garnish, Edward William; Stark, Bernard Peter; and Wilson, Robert George, 3,912,566.

Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,912,729.

Doby, William P., to Westinghouse Electric Corporation. Outage indicating apparatus for meter telemetry systems including data recorders. 3,913,130, Cl. 360-6.000.

Doby, William P.: *See—*
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Dr. -Ing. Ludwig Pietzsch: *See*—
Thate, Helmut; and Wamser, Manfred, 3,912,303.
Dodd, Louie R. Motorized birdie ride. 3,911,866, Cl. 119-26.000.
Doerner, William A., to Du Pont de Nemours, E. I., and Company. Rotary cooling and heating apparatus. 3,911,694, Cl. 62-499.000.
Dogliotti, Renato: *See*—
De Vincentiis, Girolamo; Dogliotti, Renato; and Luvison, Angelo, 3,913,093.
Dohogne, James R.; and Driskill, Glen W., to Sperry Rand Corporation. Belt driven gyroscopic instrument for an aircraft. 3,911,591, Cl. 33-330.000.
Doin, Bernard J.; and Thomas, Jean P., to Societe Nationale des Poudres et Explosifs. Pyrotechnic compositions for gas generation. 3,912,561, Cl. 149-35.000.
Dolch, Klaus, to International Standard Electric Corporation. Fail-safe logic circuit arrangement for use in railway signalling systems. 3,913,023, Cl. 328-133.000.
Domicone, Joseph J.; and Parker, Charles J., to Corning Glass Works. Protective coating for beta-spodumene regenerators. 3,911,998, Cl. 165-10.000.
Dominguez, Loreto M.: *See*—
Chiappe, Jorge A.; and Bianco, Hercules C. A. B., 3,912,694.
Domnick, Arno. Cover for channels and ducts. 3,912,408, Cl. 404-35.000.
Doreleijers, Theodorus Cornelis Gerardus: *See*—
Eisses, Reinhart Charles Willem; Bongenaar, Hendrik; and Doreleijers, Theodorus Cornelis Gerardus, 3,912,105.
Dotsch, Arnold: *See*—
Sigott, Siegfried; Zitz, Alfred; Schwelberger, Hubert; and Dotsch, Arnold, 3,911,877.
Doughty, John I., to Minnesota Mining and Manufacturing Company. Curable plastic composition. 3,912,696, Cl. 260-79.100.
Douzon, Colette A.: *See*—
Huguet, Gerard J.; Fauran, Claude P.; Douzon, Colette A.; Raynaud, Guy M.; and Thomas, Janine M., 3,912,747.
Dover Corporation: *See*—
Holland, Gordon A.; and Adams, Gilbert T., 3,912,049.
Dow Chemical Company, The: *See*—
Chisholm, Douglas S., 3,912,799.
Frevel, Ludo K.; and Kressley, Leonard J., 3,912,789.
Giacobbe, Thomas J.; and Norton, Elizabeth J., 3,912,717.
Goring, Cleve A. I.; and Youngson, Charles R., 3,912,813.
Newman, Ritchey O., Jr., 3,912,439.
Dow Corning Corporation: *See*—
Brown, Paul L., 3,912,651.
Colquhoun, Joseph A., 3,912,652.
Dowell, Robert D. Coating for metal surfaces and method for application. 3,911,891, Cl. 123-191.00A.
Dowrick, John Sydney; and Marsden, Jeffrey Lewis, to Beecham Group Limited. Method of treating bovine mastitis. 3,912,806, Cl. 424-16.000.
Dowty Mining Equipment Limited: *See*—
Cheshir, Keith, 3,911,794.
Drackett Company, The: *See*—
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Dragerwerk Aktiengesellschaft: *See*—
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Dresser Industries, Inc.: *See*—
Schirm, Albert C.; and Kunderman, Fred K., 3,912,342.
Drews, Werner Hermann Hans, to Trutzschler and Company. Depositing chute for pneumatic conveyance of flock. 3,912,474, Cl. 55-524.000.
Driam Metallprodukt GmbH & Co. KG, Firma: *See*—
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Drilling Systems International, Inc.: *See*—
Meeker, Joseph Fitzpatrick; Keen, Michael Donahoo; Lee, Larry E.; and LeJeune, Roderick Charles, 3,912,227.
Driskill, Glen W.: *See*—
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Dryer, Stanley Raymond Collins, to British Petroleum Company Limited, The. Oil treatment process. 3,912,618, Cl. 208-87.000.
Dube, Paul Omer, to King Instrument Corporation. Wire feeding mechanism. 3,912,147, Cl. 226-151.000.
Ducommun, Georges: *See*—
Adler, Karl; and Ducommun, Georges, 3,913,086.
Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; Bykovets, Konstantin Petrovich; and Zavodyan, Vitaly Voitsekhovich. Apparatus for building up with deposited metal the seating surfaces of valves. 3,911,859, Cl. 118-1.000.
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Duffy, Michael J.: *See*—
Ziemann, Carl N.; Duffy, Michael J.; and Weatherhead, Albert J., III, 3,912,128.
Dugan, Thomas J. Door lock. 3,912,310, Cl. 292-169.140.
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Duggan, James Daniel. Chain guiding apparatus. 3,911,764, Cl. 74-577.00R.
Duke, Cecil O., to Lawrence Peska Associates, Inc., a part interest. Electromechanical leg exercising apparatus. 3,911,908, Cl. 128-25.00R.
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Dunlop Limited: *See*—
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Dunn, George Harvey, Jr., to Dart Industries Inc. Olefin polymerization process. 3,912,701, Cl. 260-93.700.
Dunwell, David William: *See*—
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Dusevoir, Robert H. Method of packaging, shipping and installing discharge electrodes for electrostatic precipitators. 3,911,566, Cl. 29-624.000.
Dyer, John D.; and Smith, Roger A., to Lear Siegler, Inc., Krueger Division. Adjustable constant volume valve. 3,911,945, Cl. 137-499.000.
Dyle, Charles A.; and Edwards, John W., to Hammond Corporation. Arpeggio keyboard. 3,911,780, Cl. 84-423.000.
Dymo Industries, Inc.: *See*—
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Earnheart, Merlin E., to Truckweld Equipment Co. Gathering cable-dispensing vehicle. 3,912,225, Cl. 254-134.30R.
Eastman Kodak Company: *See*—
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Eccleston, Kenneth Thomas; and Frizzell, John George, to Foseco International Limited. Methods of and apparatus for loading automatic hot topping apparatus with hot topping slabs. 3,911,551, Cl. 29-428.000.
Eckerle, Otto; and Jung, Robert, to Eckerle, Otto. High pressure gear pump. 3,912,427, Cl. 418-71.000.
Eckrodt, Gunter, to Thies KG. Apparatus for wet treatment of strands of textile material. 3,911,702, Cl. 68-177.000.
Edberg, Ralph C., to Minnesota Mining and Manufacturing Company. Microporous sheet having suede-like surface and method of making. 3,912,840, Cl. 428-85.000.
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terence P., to United States of America, Agriculture. Attractants for yellow jackets (Vespula spp.: vespidae). 3,912,810, Cl. 424-84.000.
Edlin, Frank E.; and Tucker, Joseph M., Jr., to International Plastics, Inc. Method of producing porous polymeric articles. 3,912,800, Cl. 264-53.000.
Edmonds, Emmilou, executrix: *See*—
Short, James N.; Edmonds, Lee O., deceased; and Edmonds, James T., Jr., 3,912,695.
Edmonds, James T., Jr.: *See*—
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Edmunds, George W.: *See*—
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Edoardo, Pilutti. Device for sources of piezoelectric ignition. 3,912,953, Cl. 310-8.700.
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Edwards, John W.: *See*—
Dyle, Charles A.; and Edwards, John W., 3,911,780.
Edwin Cooper, Inc.: *See*—
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Eggert, Walter S., Jr., to Budd Company, The. Crash energy-attenuating means for a vehicle frame construction. 3,912,295, Cl. 280-106.00R.
Eguchi, Hajime: *See*—
Enei, Hitoshi; Anzai, Yasuo; Sato, Katsuaki; Eguchi, Hajime; and Hirose, Yoshio, 3,912,587.
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Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, 3,912,834.
Eich, Edmund; von den Hoff, Anton; and Neuser, Rolf Dieter, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Milling machine for milling crankwebs and crankpins. 3,911,788, Cl. 90-20.000.
Eikenes, Erlend, to Thune-Eureka A/S. Counter pressure means for a screw press. 3,911,809, Cl. 100-148.000.
Einhorn, Ruediger, to Coats & Clark, Inc. Method of forming a push pin article. 3,911,516, Cl. 10-161.000.
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Eisses, Reinhart Charles Willem; Bongenaar, Hendrik; and Doreleijers, Theodorus Cornelis Gerardus, to U.S. Philips Corporation. Implosion-free picture tube. 3,912,105, Cl. 220-2.10A.
Elbers, Arthur H.; and Headley, David B., to General Motors Corporation. Variable ratio brake pedal linkage. 3,911,760, Cl. 74-512.000.
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Elliott, Douglas Ernest, to Fluidfire Development Limited. Heat exchanger. 3,912,002, Cl. 165-104.000.
Ellithorpe, Ernest Ralph; and Fletcher, Ronald Bruce, to Vennard & Ellithorpe. Apparatus for the solidification of molten sulphur. 3,912,431, Cl. 425-6.000.
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Elstow, William Rupert Brooke: *See*—
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Ely, Robert B.; Pogainis, Edmunds M.; and Hoffman, Clarence A., to Sterling Drug Inc. Catalyzed process and catalyst recovery. 3,912,626, Cl. 210-50.000.
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Endo, Takashi; and Morota, Masaaki, to Yashica Co., Ltd. Focal plane shutter for photographic camera. 3,913,117, Cl. 354-242.000.
Enei, Hitoshi; Anzai, Yasuo; Sato, Katsuaki; Eguchi, Hajime; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method of producing guanosine by fermentation. 3,912,587, Cl. 195-28.00N.
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England, Christopher, to California Institute of Technology. Zinc-halide battery with molten electrolyte. 3,912,999, Cl. 320-22.000.
England, Wayne. Stepped hull for jet-powered boat. 3,911,846, Cl. 114-66.50R.
England, William A., to Honeywell Inc. Plated wire matrix switch for switching digital data. 3,913,078, Cl. 340-174.0PW.
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Erhardt, William K., to Honeywell Inc. Resistance reference junction compensator. 3,911,745, Cl. 73-341.000.
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Essex, Frederick William, Jr.; and Pippitt, Max Elliot, to American Can Company. Metal container and method for making same. 3,912,109, Cl. 220-66.000.
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Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Oxidative dehydrogenation of alkenes or alkadienes to furan compounds. 3,912,763, Cl. 260-346.10R.
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Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,912,788, Cl. 260-668.00C.
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Favata, Joseph N.; and Biondi, Edgar I., to United States of America, Air Force. High voltage capacitor. 3,912,986, Cl. 317-242.000.
Fawzi, Maged M.; and Quebedeaux, Bruno, Jr., to Du Pont de Nemours, E. I., and Company. Ureidotriazoles as cytokinins and plant antisenescence agents. 3,912,496, Cl. 71-92.000.
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Fenster, Abraham S.; and Salloga, Fred W., to United States Pipe and Foundry Company. Stem seal and retainer for gate valve. 3,912,221, Cl. 251-214.000.
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Ferguson, George R.; and King, David Leonard, Jr., to Duff-Norton Company, Inc. Fluid device with back pressure valve arrangement. 3,912,046, Cl. 184-55.00A.
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Fillmore, Richard Plumb, to RCA Corporation. Voltage regulator circuit with relatively low power consumption. 3,913,006, Cl. 323-17.000.
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Gallagher, James P., to Atlantic Richfield Company. Lubricating oil production utilizing hydrogen in two catalytic stages. 3,912,620, Cl. 208-210.000.

Galli, Riccardo; and Olivani, Franco, to Montecatini Edison S.p.A. Negative electrode for solid electrolyte cells. 3,912,536, Cl. 136-6.00R.

Gano, Richard C. Lockable, self-leveling wall mounting device for picture frames and the like. 3,912,216, Cl. 248-475.00R.

Gapp, Roland Howard; York, Ira; and Toosky, Rahmatollah Fakhri, to Townsend Company a division of Textron. Rivet of titanium-columbium alloy and method of making the same. 3,911,783, Cl. 85-73.000.

Garbee, Allen K.; Honaker, John A.; and Sexton, James R., to Armco Steel Corporation. System for the safe handling of pulverized coal. 3,912,015, Cl. 169-61.000.

Gardi, Rinaldo; Vitali, Romano; and Falconi, Giovanni, to Warner-Lambert Company. Norethindrone O-alkyloximes. 3,912,768, Cl. 260-397.500.

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Gauer, Joseph August, to Whirlpool Corporation. Shipping mount and suspension system for appliance. 3,912,207, Cl. 248-25.000.

Gault, Robert H., to Bethlehem Steel Corporation. Positive pull-down non-pounding oil well pump for use with flexible pumping strand. 3,912,420, Cl. 417-260.000.

Gavaler, John R.; Hulm, John K.; Janocko, Michael A.; and Jones, Clifford K., to Westinghouse Electric Corporation. Method for making thin film superconductors. 3,912,612, Cl. 204-192.000.

Gawlick, Heinz; and Marondel, Guenther, to Dynamit Nobel Aktiengesellschaft. Caseless formed propellant powder charge. 3,911,825, Cl. 102-100.000.

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Gelfand, George Edwin. Decorative article comprising knit stretch material. 3,911,617, Cl. 46-151.000.
Gelin, Robert, to G. L. Rexroth GmbH. Radial piston machine. 3,912,421, Cl. 417-273.000.
Geller, William L.; and McCarthy, Jeremiah P., to GTE Laboratories Inc. Negative impedance converter. 3,913,125, Cl. 357-46.000.
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Greeley, Edward M., to Carrier Corporation. Method of determining the alkali metal hydroxide concentration in an aqua-ammonia-chromate solution for use in an absorption refrigeration system. 3,912,453, Cl. 23-230.00R.

Green, Charles F., to Libbey-Owens-Ford Company. Glass melting furnace and method of operation. 3,912,485, Cl. 65-136.000.

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Haber, Terry M. Actuating mechanisms for wrist instruments. 3,911,666, Cl. 58-50.00R.

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Haeberle, Robert W.; Lennon, Donald J. J.; and Schleifstein, Harvey G., to Carter's Ink Company, The. High speed non-impact printing. 3,913,110, Cl. 346-139.000.

Hagelberg, Torvald, to Bengt Petersson New Products Investment AB. Miniature golf course. 3,912,275, Cl. 273-176.0FA.

Hagfors, Norman R.; and Hymes, Alan C., to Stimulation Technology, Inc. Method and structure of preventing and treating ileus, and reducing acute pain by electrical pulse stimulation. 3,911,930, Cl. 128-421.000.

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Halstead Kenneth G.; and Benbow, Eugene C., to Westinghouse Electric Corporation. Demand meter for on-peak maximum demand metering. 3,913,014, Cl. 324-103.00R.

Hamilton, George Adam, to Speedcranes Limited. Apparatus for raising floating bodies. 3,912,319, Cl. 294-83.00R.

Hamilton, Martin W., to Eaton Corporation. Crane load warning system. 3,913,081, Cl. 340-267.00C.

Hamm, Jeffrey E., to Jenson, Robert S., a part interest. Ionization aerosol detector. 3,913,082, Cl. 340-237.00S.

Hammelmann, Paul. Apparatus for external treatment of ships' hulls or the like. 3,911,849, Cl. 114-222.000.

Hammer, Jacob Meyer, to RCA Corporation. Optical fiber to planar waveguide coupler. 3,912,363, Cl. 350-96.00C.

Hammes, Wilhelm. Apparatus for closing drums. 3,912,110, Cl. 220-67.000.

Hammond Corporation: *See—*
Dyle, Charles A.; and Edwards, John W., 3,911,780.

Hammond, James T., to Caterpillar Tractor Company. Torque rise limiting governor. 3,911,885, Cl. 123-140.00R.

Hammond, Robert James; Miller, Carl Wayne; and Culver, Larry Fred, to RCA Corporation. Turntable speed lock system. 3,912,283, Cl. 274-39.000.

Handke, Kenneth E. Clutch with centrifugal pump. 3,912,060, Cl. 192-113.00B.

Handley, Paul R.: *See—*
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Hanke, David E., to Kimberly-Clark Corporation. Injector device for tampons or the like made from odor-free thermoformed heat-degraded polyvinyl alcohol. 3,911,917, Cl. 128-263.000.

Hankin, George. Breast prosthesis. 3,911,503, Cl. 3-36.000.

Hannah, James P., Jr., to Foster Wheeler Energy Corporation. Backing rings for welded pipe joints. 3,912,150, Cl. 228-50.000.

Hanser, Paul Edmund; and Gebauer, Thomas Edward, to Deere & Company. Circle drive pinion for motor grader. 3,911,758, Cl. 74-462.000.

Happy, Raymond, to General Motors Corporation. Polishing apparatus. 3,911,624, Cl. 51-5.00D.

Haque, Riaz-ul; and Murphy, Richard A., to International Foundation of Microbiology. Multiple inoculating system. 3,912,596, Cl. 195-127.000.

Harada, Susumu: *See—*
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Harbers, Henry C., to Western Unit Corporation. Retractable load booster assembly for large cargo trucks. 3,912,293, Cl. 280-81.00R.

Harbison, William H.; and Mohnach, Michael G., to Anderson Company, The. Universal refill. 3,911,523, Cl. 15-250.420.

Harding, Brian; Aldis, Arthur John; and Collins, Kenneth Edmund, to Parkinson Cowan Appliances Limited. Control of gas fired appliances. 3,912,161, Cl. 236-1.00A.

Harding, Edward B.: *See—*
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Hardtmann, Goetz E., to Sandoz Inc. N-substituted anthranilic anhydrides. 3,912,731, Cl. 260-244.00A.

Hardware Designers, Inc.: *See—*
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Harigaya, Hiroshi; Sakamoto, Motoyoshi; and Kanai, Masao, to Kabushiki Kaisha Suwa Seikosha. Complementary MIS-type semiconductor devices and methods for manufacturing same. 3,912,559, Cl. 148-187.000.

Harlan, Robert E.: *See—*
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Harms, A. D., Jr.: *See—*
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Harnden, John D., Jr., to General Electric Company. Incandescent lamp series string having protection against voltage surges. 3,912,966, Cl. 315-46.000.

Harries, David Anthony, to Girling Limited. Modulator assemblies for hydraulic braking systems. 3,912,339, Cl. 303-21.00F.

Harris, Garrett H. Stove construction. 3,911,892, Cl. 126-9.00R.

Harris-Intertype Corporation: *See—*
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Harris, Jimmy W.: *See—*
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Harris, Orval A., to Mallinckrodt Chemical Works. Apparatus for eluting a daughter radioisotope from a parent radioisotope. 3,912,935, Cl. 250-506.000.

Harris, Thomas J.: *See—*
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Harris, Vernon C. Battery charging, storing and dispensing device. 3,912,998, Cl. 320-2.000.

Harrison, Richard A., to Monarch Marking Systems, Inc. Record reading apparatus. 3,912,909, Cl. 235-61.11R.

Harshberger, Russell P., to Bohler, Donald. Snap-on measuring dispenser for coffee containers and the like. 3,912,126, Cl. 222-307.000.

Hartbauer, Ellsworth A.; and Rehr, Henry W., to Crown Zellerbach Corporation. Roll product with manually graspable tail end and manufacture thereof. 3,912,571, Cl. 156-351.000.

Hartig, John W., Jr.; and Showalter, Casper W., to Butternut Corporation. Grinding mill for nuts. 3,912,179, Cl. 241-248.000.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Method and apparatus for bonding miniature semiconductor pill-type components to a circuit board. 3,911,568, Cl. 29-626.000.

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Hartmann, Rudolf, to Bell & Howell Company. Electronic lens tester. 3,912,396, Cl. 356-124.000.

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Hartness, Thomas P.; and Hartness, Robert G. Positioning arm for case loader. 3,911,647, Cl. 53-248.000.

Hasegawa, Yo: *See—*
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Hatanaka, Chitoshi: *See—*
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Hatfield, Richard, Jr.; and Steele, Howard R., to Upjohn Company, The. Recovery of polymethylene polyphenyl polyisocyanate from a phoshenosed polyamine feed. 3,912,600, Cl. 203-73.000.

Hattes, Neil R., to Chemetron Corporation. Respiration monitoring method and apparatus. 3,911,899, Cl. 128-2.00S.

Haupt, Heinrich; Vernaleken, Hugo; Weirauch, Kurt; and Haberland, Ulrich, to Bayer Aktiengesellschaft. Process for preparing halogen-substituted aromatic polycarbonates. 3,912,687, Cl. 260-47.0XA.

Haussels, Berthold, to Acousa Saxon, S.A., Firma. Castor, particularly for hospital beds. 3,911,525, Cl. 16-35.00R.

Haven, Harold Arthur, to General Motors Corporation. Service card dispenser. 3,911,855, Cl. 116-114.00W.

Havens, Richard Calvin, to Motorola, Inc. Negative resistance high-Q-microwave oscillator. 3,913,035, Cl. 331-107.00R.

Havriliak, Stephen, to Rohm & Haas Company. Casting resin system containing acrylic polymer in acrylic monomer, diepoxide, and polyethylenically unsaturated monomer. 3,912,773, Cl. 260-42.280.

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Hayashibara Biochemical Laboratories, Incorporated: *See—*
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Hayner, Paul F., to Sanders Associates, Inc. Low friction piston type pilot requiring no dither. 3,912,222, Cl. 251-282.000.

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Heesemann, Karl. Belt grinding machine adapted to grind a flat or curved surface. 3,911,627, Cl. 51-137.000.

Hefendahl, Hans Friedrich: *See—*
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Hehl, Karl. Rotary assembly for the adjustment of hydraulic throttle valves in injection molding machines. 3,911,763, Cl. 74-553.000.

Hehl, Karl. Lever-actuated bias for flow responsive injector nozzle. 3,912,133, Cl. 222-496.000.

Heid, Christian; Hoffmann, Dieter; and Polster, Johannes, to Cassella Farbwerke Mainkur AG. Use of perfluoralkylphosphorus compounds as foam-dampening agents. 3,912,654, Cl. 252-321.000.

Heidinger, Clement. Rotatable circulating valve for subsurface oil pumps. 3,912,424, Cl. 417-434.000.

Heikes, George E., Jr.: *See—*
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Heinen, Harold J.: *See—*
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Heininger, Richard T., to GEM Industries, Inc. Corner connector. 3,912,407, Cl. 403-406.000.

Heinrich, Ernst; and Muller, Rolf, to Cassella Farbwerke Mainkur AG. Hydroxy-pyrid one-monosulfonic acids. 3,912,744, Cl. 260-294.80R.

Heinrich, Ernst; and Muller, Rolf, to Cassella Farbwerke Mainkur AG. Hydroxy-pyridone-monosulfonic acids. 3,912,745, Cl. 260-294.80R.
Helbling, Edward. Hair dryer. 3,911,934, Cl. 132-9.000.
Hellsten, Karl Martin Edvin: *See—*
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Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Certain 2,4-dienoic acid esters as insect control agents. 3,912,815, Cl. 424-312.000.
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Herzhoff, Peter; Gref, Hans; Bruck, Herbert; and Busch, Josef, to Agfa-Gevaert Aktiengesellschaft. Test installation for single layer or multiple layer coating and drying of sheets of paper or film. 3,911,863, Cl. 118-68.000.
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Hudson, Frederick W., to Xerox Corporation. Toner preloaded magnetic brush development system. 3,911,864, Cl. 118-637.000.
Hudson, Marshall C., to Corning Glass Works. Termination for fiber optic bundle. 3,912,362, Cl. 350-96.00B.
Hudson, Marshall C., to Corning Glass Works. Mixer for optical waveguide bundle. 3,912,364, Cl. 350-96.00C.
Huemmer, Thomas F.; and Plooy, Ronald J., to O'Brien Corporation, The. Radiation curable can coating composition. 3,912,670, Cl. 260-23.0EP.
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Hughes, James K.; and Erickson, Wayne K., to Phillips Petroleum Company. Method for crimping synthetic thermoplastic fibers. 3,911,539, Cl. 28-72.140.
Hughes, Leon; and Crabtree, Michael, to Hewlett-Packard Limited. Method and apparatus for measuring conversion of amplitude modulation to phase modulation. 3,913,011, Cl. 324-57.00R.
Hughes, Ronald William, to Lucas Electrical Company Limited, The. Fuel supply systems for internal combustion engines. 3,911,872, Cl. 123-32.0EA.
Huguet, Gerard J.; Fauran, Claude P.; Douzon, Colette A.; Raynaud, Guy M.; and Thomas, Janine M., to Delalande S.A. Derivatives of 2-hydroxymethyl-1,3,4-oxadiazole. 3,912,747, Cl. 260-307.00G.
Hujik, Ladislav, to Bata Shoe Company, Inc. Mold filling insert for injection molding machine. 3,912,437, Cl. 425-247.000.
Hukuba, Hiroshi; Ikegami, Iwao; and Yasuda, Teruaki, to Kabushiki Kaisha Hukuba Future Research. Apparatus for housing hose of suction cleaner. 3,911,944, Cl. 137-355.200.
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Hunkins, James J. Calendar kit and method of use. 3,911,606, Cl. 40-110.000.
Hunsperger, Robert G.; and Hirsch, Nathan, to Hughes Aircraft Company. Enhancement mode, Schottky-barrier gate gallium arsenide field effect transistor. 3,912,546, Cl. 148-1.500.
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Hurst, Autry E. Means for fastening wood veneer sheets in edge-to-edge relationship. 3,911,978, Cl. 144-2.00R.
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Iijima, Tokuji; Odawara, Yooji; and Yamaguchi, Tetsuo, to Hitachi, Ltd. Process for aerobic cultivation of microorganism. 3,912,585, Cl. 195-28.00R.
Ikeda, Mitsusuke; Sato, Hisanao; Torii, Etsuko; Morimoto, Kazuhisa; and Hasegawa, Yo, to Matsushita Electric Ind., Ltd. Electrophotographic element comprising an organic photoconductive layer sensitized locally at its surface. 3,912,508, Cl. 96-1.600.
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Irwin, John A., to General Motors Corporation. Combustor with ceramic liner. 3,911,672, Cl. 60-39.320.
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Ise, Minoru, to Ise Kogyo Kabushiki Kaisha. Grinding machine for household use. 3,911,625, Cl. 51-109.00R.
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Ito, Masaru; and Mitsuhashi, Sadayuki, to Nippon Electric Company, Limited. Multielement magnetic head comprising a common magnetic member uniting pole tips and an opposing magnetic member. 3,913,139, Cl. 360-103.000.
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Iwanaga, Kazuyoshi; Kawamoto, Tamio; Miyauchi, Toshiyuki; and Ohtsuka, Kunio, to Nissan Motor Company Limited. Transmission parking lock mechanism. 3,912,050, Cl. 188-69.000.

Iwanciow, Bernard L., to United States of America, Air Force. Variable free stream buffer. 3,912,934, Cl. 250-504.000.

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Izumi, Masao, to Nissan Motor Company Limited. Fluid pressure to mechanical rotational position converting mechanism. 3,911,793, Cl. 92-33.000.

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J. M. Voith, GmbH: *See*—
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Jackson Communication Corporation: *See*—
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Jackson, Richard L., to Jackson Communication Corporation. Corner strand brake assembly. 3,912,226, Cl. 254-134.3PA.

Jackson, Richard R. Humidifying gas. 3,912,795, Cl. 261-36.00R.

James, Daniel Shaw, to Du Pont de Nemours, E. I., and Company. Biscationic pyridinium monoazo dyes useful for dyeing acid-modified nylons. 3,912,708, Cl. 260-156.000.

James, Michael: *See*—
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Janex, Albert, to International Standard Electric Corporation. Device for decoding pulse-coded data. 3,913,100, Cl. 343-6.5LC.

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Janssen, Kenneth T., to United Technologies Corporation. Multiblend powder mixing apparatus. 3,912,235, Cl. 259-4.000.

Janssens, Wilhelmus; Dierckx, Jozef Aime; and Hubert, Hendrik, to Agfa-Gevaert, a naamloze vennootschap. Electrophotographic recording material with a photoconductive carbazole compound. 3,912,509, Cl. 96-1.500.

Jansson, Torgny. Rolling friction drive device. 3,911,626, Cl. 134.5 R-.

Japan Atomic Energy Research Institute: *See*—
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Jarke Corporation: *See*—
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Jarman, David J. Entry and exit stacking system. 3,912,253, Cl. 271-5.000.

Jarnaker, Johan Julius. Apparatus for automatically controlling the speed of a track-guided vehicle. 3,911,827, Cl. 104-147.00R.

Jarowenko, Wadym, to National Starch and Chemical Corporation. Process for preparing novel cationic flocculating agents and paper made there-with. 3,912,715, Cl. 260-233.30R.

Jauch, Ewald H.; and Heubach, Edward C., to Owens-Corning Fiberglas Corporation. Glass melting apparatus and method of operating same. 3,912,486, Cl. 65-136.000.

Jay, Richard S., to Jarke Corporation. Modular storage frame for flat sheet materials. 3,912,083, Cl. 211-50.000.

Jenkins, Michael W. M., to Lockheed Aircraft Corporation. Side force control for airplanes. 3,912,202, Cl. 244-52.000.

Jennings, James L., to Universal Oil Products Company. Cleaning of membrane surfaces. 3,912,624, Cl. 210-23.000.

Jennings, Lewis F.; and Bower, Kenneth W., to UARCO Incorporated. Powered adjustable trimmer construction. 3,911,774, Cl. 83-425.200.

Jensen, Knud. Exhaust system. 3,911,676, Cl. 60-301.000.

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Johansson, Karl Ingvar Georg, to Eriksson, Erik Gustav Lennart. Procedure for surface treatment of wood. 3,912,836, Cl. 427-341.000.

Johansson, Ronald C., to Minnesota Mining and Manufacturing Company. Solderless connector. 3,912,356, Cl. 339-98.000.

Johansson, Sven-Olof Gustav. Ventilated head cover and safety hood. 3,911,914, Cl. 128-142.700.

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John Wyeth & Brother Ltd.: *See*—
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Johnson, Donald F. Hay loading apparatus. 3,911,650, Cl. 56-13.300.

Johnson, Earl E.; and Gladoske, Calvin, to Giddings & Lewis, Inc. Tool interchange system with break-away shoes. 3,911,540, Cl. 29-26.00A.

Johnson, Keith R.: *See*—
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Johnson, Lennart L. Toilet cleaning apparatus. 3,911,507, Cl. 4-224.000.

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Johnson, Ralph E., to Singer Company, The. Looptaker drive for a sewing machine. 3,911,841, Cl. 112-184.000.

Johnson Rubber Company, The: *See*—
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Johnson, Victor. Sprinkler mounting device. 3,912,171, Cl. 239-230.000.

Johnson, Walter J., to Bell & Howell Company. Adjustable photographic objective. 3,912,377, Cl. 350-215.000.

Johnson, Warren F., to Mohasco Corporation. Rocker reclining hardware. 3,912,327, Cl. 297-272.000.

Johnson, Wayne C.: *See*—
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Johnson, Wayne R., to Babcock & Wilcox Company, The. Combination welding and brazing device. 3,912,148, Cl. 228-2.500.

Johnson, Wilfred V., to U.S. Fire Control Corporation. Delayed closing fire sprinkler heads. 3,911,940, Cl. 137-79.000.

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Jones, Donnie R. Internal pipe cutting apparatus. 3,911,574, Cl. 30-105.000.

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Jones, Vercoe C., to Si Handling Systems, Inc. Wheel. 3,912,332, Cl. 301-5.700.

Jong, Howard W., to McDonnell Douglas Corporation. Load lift and skid pad assembly. 3,912,206, Cl. 248-24.000.

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June, Ethel L. Survival apparatus. 3,911,913, Cl. 128-142.500.

Jung, Robert: *See*—
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Kabushiki Kaisha KIP: *See*—
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Kabushiki Kaisha Sega Enterprises: *See*—
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Kabushiki Kaisha Suwa Seikosha: *See*—
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Kabushiki Kaisha Toyota Chuo Kenkyusko: *See*—
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Kaes, Hans-Herbert; and Staaden, Hans, to Ernst Leitz G.m.b.H. Silver containing, semiconductive glass of improved resistivity and secondary emission and process of making it. 3,912,522, Cl. 106-47.00R.

Kageyama, Kunio: *See*—
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Kakihara, Kunio: *See*—
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Kalb, Henry T.; Crosswy, Frank L.; McClure, Jim A.; Harding, Edward B.; McClure, Billy J.; and Inglish, Donnie J., to United States of America, Air Force. Doppler data processor with digital computing pulse rate filter. 3,912,915, Cl. 235-152.000.

Kalfsbeek, James S.; and Kalfsbeek, Peter C. System and method for removing feathers from ducks and other fowl. 3,911,530, Cl. 17-11.10R.

Kalfsbeek, Peter C.: *See—*
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Kaliswaart, Adri C., to North American Philips Corporation. Driving circuit for pin diode switches. 3,912,949, Cl. 307-280.000.

Kamata, Takashi: *See—*
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Kamimura, Haruo; Nakai, Toshitsugu; and Wadano, Katsumi, to Nippon Kokan Kabushiki Kaisha. Method of automatically rotating a hollow shell in a plug mill. 3,911,714, Cl. 72-209.000.

Kaminsky, Daniel, to Warner-Lambert Company. Process for the production of chromone derivatives and intermediates produced thereby. 3,912,760, Cl. 260-340.500.

Kamp, Heinz, to W. Schlafhorst & Co. Formed sinker in warp knitting machines with devices for handling long wefts. 3,911,699, Cl. 66-86.00M.

Kan, Masao; Ishii, Hirokazu; Murata, Yasuzo; Maruya, Takayuki; and Yamada, Akio. Recording material. 3,912,831, Cl. 427-145.000.

Kan, Okihiko: *See—*
Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, 3,912,444.

Kanai, Masao: *See—*
Harigaya, Hiroshi; Sakamoto, Motoyoshi; and Kanai, Masao, 3,912,559.

Kane, William Paul, to Du Pont de Nemours, E. I., and Company. Vacuum skin-package for cooking food. 3,912,823, Cl. 426-129.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Imai, Satoshi; Eguchi, Tamiyuki; and Shimokawa, Masaaki, 3,912,834.

Kaneko, Fuminori; Ureshino, Kashirou; Miyata, Ichiro; and Tomita, Masahito, to Kobe Steel Ltd. Apparatus for manufacturing annular helix wire beads. 3,912,180, Cl. 242-4.0BE.

Kaneko, Yasuhisa; and Noda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fiber impregnated reinforced catalyst carrier and a process for the production thereof. 3,912,658, Cl. 252-455.00R.

Kaneyuki, Hiroo; and Ogata, Koichi, to Mitsui Petrochemical Industries, Ltd. Method of producing dicarboxylic acids by microorganisms. 3,912,586, Cl. 195-28.00R.

Kanthal Corporation, The: *See—*
Giler, Roger Rolf, 3,912,905.

Kao, Wen-Ling: *See—*
Leeming, Michael R. G.; Strike, Donald P.; and Kao, Wen-Ling, 3,912,725.

Kapral, Ales M., to Akrosil Corporation. Coating substrate with thermosetting resin containing printed design. 3,912,569, Cl. 156-230.000.

Karass, Thomas John. Hook and hook assembly using a sling of band material. 3,912,214, Cl. 248-323.000.

Karlovics, Steven: *See—*
Chandler, James F.; Chiodi, Wayne R.; Figlewicz, Raymond C.; and Karlovics, Steven, 3,912,970.

Karlson, Eskil L. Fluid treatment apparatus. 3,912,636, Cl. 210-264.000.

Karpinski, Janusz M.; Rentschler, John S.; and Stone, Rodney L., to Bethlehem Steel Corporation. Process for preparation ores for concentration. 3,912,174, Cl. 241-24.000.

Kartell S.p.A.: *See—*
von Bohr, Olaf, 3,912,210.

Kartovsky, Ivan Vasilievich: *See—*
Panasjuk, Vladimir Vasilievich; Makarov, Genrikh Nikolaevich; Teterko, Anatoly Yakovlevich; and Kartovsky, Ivan Vasilievich, 3,913,009.

Kasano, Hiroyuki, to Hitachi, Ltd. Optical semiconductor device. 3,912,923, Cl. 250-211.00J.

Kashio, Toshio, to Casio Computer Co., Ltd. Printing apparatus having automatic underlining without backspacing. 3,912,065, Cl. 197-19.000.

Kashiwayanagi, Yuzo: *See—*
Himono, Yusaku; Kashiwayanagi, Yuzo; and Murata, Mikio, 3,913,037.

Kashnow, Richard A., to General Electric Company. Single polarizer reflective liquid crystal display. 3,912,369, Cl. 350-160.0LC.

Køstner, Arnold. Apparatus for making cigarette filter tubes. 3,911,797, Cl. 93-1.00C.

Kastner, Erich; and Wallner, Kurt, to Arnold & Richter KG. Camera with adjustable viewfinder. 3,913,116, Cl. 354-223.000.

Kasuya, Hiroshi; and Watanabe, Norio, to Nippon Electric Company, Ltd. Connector for a circuit card having means for forcing spring contacts into contact with the card after the card is put in position. 3,912,353, Cl. 339-75.0MP.

Kato, Koso; and Shiosaka, Makoto, to Hayashibara Biochemical Laboratories, Incorporated. Process for the production of pullulan. 3,912,591, Cl. 195-31.00P.

Kato, Tadanari: *See—*
Numagami, Kiyoshi; Okuyama, Toshiki; and Kato, Tadanari, 3,912,661.

Kato, Yomei: *See—*
Mikawa, Hiroji; Kato, Yomei; and Sasaki, Kiyoshi, 3,912,476.

Katsuta, Kihei; Watanabe, Nobuya; and Matsuyama, Chiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal leak detector for a heat-insulation-lined tank for low-temperature liquids. 3,911,727, Cl. 73-49.200.

Katt, Herbert L. Highway post construction. 3,912,404, Cl. 403-2.000.

Katt, Herbert L. Frangible post coupling. 3,912,405, Cl. 403-2.000.

Katz, Paul. Radio-telephone communication system. 3,912,875, Cl. 179-41.00A.

Kawakubo, Kazuo: *See—*
Takahashi, Isao; Fujii, Motoharu; Kawakubo, Kazuo; Ariga, Masao; and Sugiura, Susumu, 3,912,388.

Kawamoto, Tamio: *See—*
Iwanaga, Kazuyoshi; Kawamoto, Tamio; Miyauchi, Toshiyuki; and Ohtsuka, Kunio, 3,912,050.

Kawanishi, Seishi: *See—*
Takagi, Isamu; Kawanishi, Seishi; and Nishizawa, Yoshihiko, 3,912,519.

Kawano, Mak S., to American Tara Corporation. Core cutting apparatus. 3,911,768, Cl. 82-86.000.

Kawasaki, Fumio: *See—*
Ueno, Hiroshi; Kawasaki, Fumio; Sasaya, Minoru; and Okubo, Kazuo, 3,912,568.

Kay, Ian Malcome: *See—*
Barker, Sydney Alan; Kay, Ian Malcome; and Kennedy, John Frederick, 3,912,593.

Kay, Ian Trevor: *See—*
Baranyovits, Francis Leslie Charles; and Kay, Ian Trevor, 3,912,812.

Kayama, Nagaoki, to Hokushin Electric Works, Ltd. Chopper-type D-C amplifying system. 3,913,001, Cl. 321-2.000.

Kazlauskas, Matthew A.: *See—*
Walker, Duncan N.; and Kazlauskas, Matthew A., 3,911,731.

Kearsley, Walter H., to Fram Corporation. Catalytic converter. 3,912,459, Cl. 23-288.0FC.

Keen, Michael Donahoo: *See—*
Meeker, Joseph Fitzpatrick; Keen, Michael Donahoo; Lee, Larry E.; and LeJeune, Roderick Charles, 3,912,227.

Keenan, Bernard J., Jr., to Sun Oil Company of Pennsylvania. Drill string retrieval device. 3,912,320, Cl. 294-86.150.

Kehry, Manfred; and Pospiech, Manfred, to Daimler-Benz Aktiengesellschaft. Alarm device for motor vehicles. 3,913,066, Cl. 340-63.000.

Keicher, Charles Augustus. Practice putting device. 3,912,276, Cl. 273-177.00A.

Keini, David; and Pessen, David W. Deceleration sensor for anti-skid vehicle brakes. 3,912,052, Cl. 188-181.00A.

Kelch, Heinz; and Schuh, Eduard, to Kienzle Apparate G.m.b.H. Latching arrangement for a recording device. 3,913,136, Cl. 360-96.000.

Keller, Juergen H. H.; and Sprague, Robert H., to Itek Corporation. Polyrhodanine photoconductive materials. 3,912,507, Cl. 96-1.500.

Kellogg, Walter J.: *See—*
Mullen, John H.; and Kellogg, Walter J., 3,912,894.

Kelly, Charles A.: *See—*
Pacifici, James G.; and Kelly, Charles A., 3,912,606.

Kelsall, Dennis, to Massachusetts Institute of Technology. Method and system of interferometric measurements of modulation transfer functions. 3,912,394, Cl. 356-113.000.

Kelsey-Hayes Company: *See—*
Bertolasi, Robert B., 3,912,340.

Kelvinator, Inc.: *See—*
Griffiths, Leslie N., 3,912,005.

Kemp, Fred S.: *See—*
Dews, George H.; and Kemp, Fred S., 3,912,538.

Kennametal Inc.: *See—*
Cantz, Rudolf, 3,911,986.
Friedline, Ernest J.; and Sorice, Edward L., 3,911,542.
Sorice, Edward L., 3,911,543.
Toews, Leonard E., 3,912,338.

Kennedy, Carl D.: *See—*
Clark, Charles R.; Gregory, M. Duane; Krehbiel, Delmar D.; Butler, Claud D.; and Kennedy, Carl D., 3,912,010.

Kennedy, John Frederick: *See—*
Barker, Sydney Alan; Kay, Ian Malcome; and Kennedy, John Frederick, 3,912,593.

Kennedy, Kurt D., to Airco, Inc. Method of physical vapor deposition. 3,912,826, Cl. 427-8.000.

Kenney, George Churchill, to North American Philips Corporation. Device for the detection of signal drop-outs. 3,912,858, Cl. 178-6.60R.

Kermarrec, Francois: *See—*
Degobert, Paul; Kermarrec, Francois; and Nadaud, Yvon, 3,912,635.

Kern, Eckhard; and Wolber, Robert, to Gebruder Junghans Gesellschaft mit beschrankter Haftung. Contact arrangement for a battery-powered watch. 3,911,663, Cl. 58-23.0BA.

Kerschner, James J., to Acme Highway Products Corporation. Sealing member. 3,912,286, Cl. 277-225.000.

Kertzscher, Claus: *See—*
Cotte, Dietrich; Scheffler, Holger; and Kertzscher, Claus, 3,911,697.

Ketchen, Eugene E.: *See—*
Case, Forrest N.; and Ketchen, Eugene E., 3,912,625.

Khainovsky, Valentin Petrovich: *See—*
Sharanov, Mikhail Alexeevich; Silukov, Gennady Alexeevich; Khainovsky, Valentin Petrovich; Olginsky, Felix Yanovich; Solovykh, Vladimir Alexeevich; and Sukhorukov, Alexandr Efimovich, 3,912,487.

Khalid, Joseph M.; and Niccolls, Richard W., to Square D Company. Hydrated zinc borate, dimethyl silicone resin arc extinguishing material. 3,912,650, Cl. 252-63.500.

Ki Chang, Michael Moon: *See—*
Leeman, Susan E.; Ki Chang, Michael Moon; Tregear, Geoffrey W.; and Niall, Hugh D., 3,912,711.

Kiel, Wolfgang; Wedemeyer, Karlfried; and Evertz, Werner, to Bayer Aktiengesellschaft. Catalytic process for preparing 3-halogen- and 3,5-dihalogen-phenols. 3,912,782, Cl. 260-620.000.

Kienhofer & Moog GmbH KG.: *See—*
Burkle, Hermann, 3,911,669.

Kienzle Apparate G.m.b.H.: *See—*
Kelch, Heinz; and Schuh, Eduard, 3,913,136.

Kihara, Kuniaki, to Nippon Electric Company, Limited. Optically coupled circuit arrangement. 3,912,951, Cl. 307-289.000.

Kikkoman Shoyu Co., Ltd.: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,912,822.

Kimberly-Clark Corporation: *See—*
Benevento, Joseph; and Hinsch, Kurt W., 3,911,499.
Hanke, David E., 3,911,917.
Krebs, Kay E.; and Arps, Marion T., 3,911,912.
Schwartz, Robert J., 3,912,567.

King, David Leonard, Jr.: *See—*
Ferguson, George R.; and King, David Leonard, Jr., 3,912,046.

King Instrument Corporation: *See—*
Dube, Paul Omer, 3,912,147.

King-Seeley Thermos Co.: *See—*
Kohl, Vance L.; and Hoenisch, Walter Harold, 3,911,691.

Kingsbury, Inc.: *See—*
McCafferty, James E., 3,912,344.

Kingsford, Ted I., to Plough, Inc. See-through cosmetic package. 3,911,936, Cl. 132-79.00R.

Kinjo, Kikuo: *See—*
Endo, Ichiro; Matsuno, Hiroshi; Kokado, Hiroshi; Inoue, Eiichi; Nishide, Katsuhiko; and Kinjo, Kikuo, 3,912,844.

Kinnear, Joseph D. Rotary electrical coupling. 3,912,352, Cl. 339-8.00R.

Kinoshita, Minoru; and Taniuchi, Osami, to Log Etronics Inc. Integrator control circuit. 3,913,022, Cl. 328-127.000.

Kirkby, Denis James: *See—*
Wynn, Edward Donald; and Kirkby, Denis James, 3,911,522.

Kishi, Ikuji: *See—*
Kondo, Renichi; Nakagawa, Koji; Fukuda, Makoto; Okai, Hiroshi; and Kishi, Ikuji, 3,912,671.

Kishi, Ken-ichi: *See—*
Nakajima, Tomio; Nakano, Masashi; Uchida, Takashi; and Kishi, Ken-ichi, 3,912,515.

Kisielewski, Robert, to Cryogenic Recycling International Inc. Mobile material cutter. 3,911,772, Cl. 83-278.000.

Kisslig, Heinz, to Utilis Mullheim AG. Jig for setting workpieces. 3,912,250, Cl. 269-91.000.

Kistner, Heinz: *See—*
Becker, Werner; Kistner, Heinz; and Volk, Heinrich, 3,911,817.

Kitamoto, Tatsuji; Shimizu, Mahito; Fujiyama, Masaaki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Method of magnetic contact duplication using temporary reduction in coercivity of master. 3,913,131, Cl. 360-17.000.

Kitano, Noritoshi: *See—*
Arai, Mamoru; Torikata, Akio; Fukatsu, Hisayoshi; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,912,811.

Kitson Poultry Equipment Co.: *See—*
Pigorsh, Walter Michael, 3,912,313.

Klang, Daniel M.: *See—*
Collins, Gary W.; and Klang, Daniel M., 3,913,141.

Klein, Leo A., to Boeing Company, The. Composite type structure for large reflective mirrors. 3,912,380, Cl. 350-310.000.

Klein, Ronald A.: *See—*
Bulloch, David K.; and Klein, Ronald A., 3,912,514.

Kliger, Herbert L. Surgical sponge. 3,911,922, Cl. 128-296.000.

Klingenberg, George R. Method and apparatus for transmission of critical information from an ill person. 3,913,092, Cl. 340-332.000.

Klund, Robert N., to Delkor Industries, Inc. Box positioning and transfer mechanism. 3,911,799, Cl. 93-53.00R.

Knapp, Alfons. Cock for hydraulic systems, particularly suitable as cut-off cock. 3,911,951, Cl. 137-550.000.

Knapp, Philip B.; and Zogg, Jon R., to Minnesota Mining and Manufacturing Company. High reliability planter apparatus. 3,912,122, Cl. 221-162.000.

Knauer, Wolfgang; and Dugan, William L., to Hughes Aircraft Company. Impedance-increasing system and in-line device therefor. 3,912,975, Cl. 317-11.00C

Knoll International, Inc.: *See—*
Plate, Richard W. R., 3,911,512.

Knowles, Albert B.: *See—*
Dell, Charles C.; Harms, A. D., Jr.; Knowles, Albert B.; Meredith, Fred D.; and Sutherland, Spurgeon, 3,912,198.

Knox, Inc.: *See—*
Calvaer, Albert J., 3,912,193.

Kobayashi, Katsuhiko: *See—*
Miyajima, Tamotsu; Enami, Shigekazu; Murai, Takamaru; and Kobayashi, Katsuhiko, 3,912,520.

Kobe Steel Ltd.: *See—*
Kaneko, Fuminori; Ureshino, Kashirou; Miyata, Ichiro; and Tomita, Masahiro, 3,912,180.
Ohashi, Tsuyoshi; Taniguchi, Hiroshi; Wakihira, Koichiro; and Kakihara, Kunio, 3,911,545.

Kobylecki, Piotr: *See—*
Boratynski, Henryk; Kobylecki, Piotr; Kosicki, Zbigniew; Marchwiak, Stanislaw; and Marciniak, Jozef, 3,912,346.

Kobylinski, Thaddeus P.; and Taylor, Brian W., to Gulf Research & Development Company. Process for preparing ruthenium phosphates and use therefor. 3,912,657, Cl. 252-437.000.

Koch, Hans Joachim: *See—*
Oertel, Harald; Zorn, Bruno; Koch, Hans Joachim; Berndt, Gerhard; and Noll, Klaus, 3,912,680.

Koch, Rolf Eckhard: *See—*
Lorenz, Horst; and Koch, Rolf Eckhard, 3,911,708.

Koch, Walter T.; and Gillespie, Robert F., to FMC Corporation. Method of preparing shirred, elastic, flexible articles. 3,912,565, Cl. 156-85.000.

Kocks, Friedrich. Apparatus for stretch forging and apparatus for forming the same. 3,911,720, Cl. 72-406.000.

Koehler, Dale R., to Bulova Watch Company, Inc. MOS transistor gain block. 3,913,026, Cl. 330-35.000.

Koeppen, William E.: *See—*
Kong, Carlito M.; Koeppen, William E.; and Brandt, Jim L., 3,911,803.

Kogler, Georg: *See—*
Kuhnlein, Hans; Kogler, Georg; and Lanzendorfer, Rudolf, 3,912,990.

Kohl, Vance L.; and Hoenisch, Walter Harold, to King-Seeley Thermos Co. Ice level sensing mechanism. 3,911,691, Cl. 62-137.000.

Kokado, Hiroshi: *See—*
Endo, Ichiro; Matsuno, Hiroshi; Kokado, Hiroshi; Inoue, Eiichi; Nishide, Katsuhiko; and Kinjo, Kikuo, 3,912,844.

Koket, George, to Hoover Ball and Bearing Company. Toilet flush tank apparatus. 3,911,504, Cl. 4-1.000.

Kokinda, James J.: *See—*
Collins, Watson R., Jr.; and Kokinda, James J., 3,911,948.

Kolin, Alexander, to Regents, University of California. Radial field electromagnetic flow meter. 3,911,742, Cl. 73-194.0EM.

Kollar, Ernest P.: *See—*
Arseneault, Paul J.; and Kollar, Ernest P., 3,912,144.

Koltsova, Anastasia Adrianovna: *See—*
Vitaliev, Georgy Viktorovich; Gvinepadze, Alexei Davidovich; Koltsova, Anastasia Adrianovna; and Smirnov, Rem Vasilievich, 3,913,075.

Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusko. Method for forming a chromium carbide layer on the surface of an iron, ferrous alloy or cemented carbide article. 3,912,827, Cl. 427-399.000.

Komiyama, Katsuhiko, to Citizen Watch Co., Ltd. Instantaneous feed mechanism for a day-date timepiece. 3,911,667, Cl. 58-58.000.

Kondo, Renichi; Nakagawa, Koji; Fukuda, Makoto; Okai, Hiroshi; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Flame-retardant resinous composition. 3,912,671, Cl. 260-23.0XA.

Kong, Carlito M.; Koeppen, William E.; and Brandt, Jim L., to General Motors Corporation. Mounting arrangement for room air conditioner. 3,911,803, Cl. 98-94.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Nakajima, Tomio; Nakano, Masashi; Uchida, Takashi; and Kishi, Ken-ichi, 3,912,515.

Konuma, Takaaki: *See—*
Watanabe, Masanori; Konuma, Takaaki; and Asano, Hirokazu, 3,912,989.

Koppelmann, Eliahu: *See—*
Wedemeyer, Karlfried; Koppelmann, Eliahu; and Evertz, Werner, 3,912,783.

Kornylak, Andrew T., to Kornylak Corporation. Radius chain conveyor. 3,912,072, Cl. 198-183.000.

Kornylak Corporation: *See—*
Kornylak, Andrew T., 3,912,072.

Kosicki, Zbigniew: *See—*
Boratynski, Henryk; Kobylecki, Piotr; Kosicki, Zbigniew; Marchwiak, Stanislaw; and Marciniak, Jozef, 3,912,346.

Koss, George A.; Gurta, Daniel J.; and Tomshany, Paul E., to Ford Motor Company. Apparatus to expand a laminating interlayer. 3,912,440, Cl. 425-335.000.

Koss, George S.; and Scott, Jay R., to United States Steel Corporation. Method and apparatus for preventing strip accumulation. 3,911,711, Cl. 72-203.000.

Koster, Frederick Henry, to American Telephone and Telegraph Company. Cable restoration system. 3,912,885, Cl. 179-175.30A.

Kosugi, Junichi: *See—*
Araki, Tadashi; Asano, Kiro; and Kosugi, Junichi, 3,912,832.

Kosugi, Minoru: *See—*
Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, 3,912,444.

Kotani, Yasuo; and Kageyama, Kunio, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Glyoxal composition. 3,912,529, Cl. 106-187.000.

Kotera, Kenichi: *See—*
Shimada, Kazuo; Kotera, Kenichi; Uemura, Takaaki; Imamura, Kunio; Ishikawa, Nobuyoshi; Hojho, Fumiko; and Ugawa, Kiyoshi, 3,912,594.

Kotzsch, Hans Joachim; and Vahlensieck, Hans Joachim, to Dynamit Nobel Aktiengesellschaft. Organosilane esters of tertiary alcohols. 3,912,774, Cl. 260-448.80R.

Kouyama, Masaharu; Nakada, Kusuo; Odaka, Toyokazu; and Miyamoto, Akio, to Hitachi, Ltd. Multi-digit display apparatus. 3,912,964, Cl. 313-519.000.

Kovolick, Albert J.: *See—*
Bridenbaugh, Peter R.; Kovolick, Albert J.; and Paradee, Sidney A., 3,911,704.

Kowada, Giichiro: *See—*
Shimada, Yasuo; and Kowada, Giichiro, 3,912,441.

Koyama, Tsuneyuki, to Victor Company of Japan, Limited. Recording and/or reproducing apparatus with automatically stopping apparatus. 3,912,205, Cl. 242-188.000.

Kozlowski, Robert H.; Sieg, Robert P.; and Scott, John W., to Chevron Research Company. Hydrocarbon conversion process. 3,912,463, Cl. 44-56.000.

Kral, Jan: *See—*
Vasicek, Zdenek; Kral, Jan; Stefek, Frantisek; Halfar, Josef; and Rosa, Drahomir, 3,912,220.

Kramer, Matthew E.: *See—*
Malcolm, Donald H.; and Kramer, Matthew E., 3,913,070.

Kramer, Wolfgang: *See—*
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, 3,912,752.

Kraus, John Walter; Veltman, Preston Leonard; and Legal, Casimer Claudius, to W. R. Grace & Co. Pneumatic application of lightweight cementitious compositions. 3,912,838, Cl. 427-426.000.

Krauss, Hans Gunter, to ELMEG Elektro-Mechanik GmbH. Reset device for digit drums and counters. 3,912,911, Cl. 235-144.0HC.

Krauss-Maffei Aktiengesellschaft: *See—*
Schwarzler, Peter, 3,911,828.

Krautkramer-Branson, Incorporated: *See—*
Niklas, Ludwig, 3,911,730.

Kravitz, Stanley; and Patel, Jitendra A., to Texaco Inc. Hydro desulfurization of heavy petroleum oil at higher temperatures and space velocities. 3,912,621, Cl. 208-216.000.

Krebs, Kay E.; and Arps, Marion T., to Kimberly-Clark Corporation. Combination surgical drape. 3,911,912, Cl. 128-132.00D.

Krehbiel, Delmar D.: *See—*
Clark, Charles R.; Gregory, M. Duane; Krehbiel, Delmar D.; Butler, Claud D.; and Kennedy, Carl D., 3,912,010.

Kress, Tommy S.: *See—*
Clark, David L.; and Kress, Tommy S., 3,912,908.

Kressley, Leonard J.: *See—*
Frevel, Ludo K.; and Kressley, Leonard J., 3,912,789.

Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrmann, Victor, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Tape transport for recording and playback apparatus, especially for teaching machines. 3,912,196, Cl. 242-204.000.

Krieg, Walter, to Digitron AG. Transport vehicle for a transport system, in particular for assembling structural units, for example motor vehicles, from structural elements. 3,912,037, Cl. 180-98.000.

Krimm, Heinrich: *See—*
Botta, Arthur; and Krimm, Heinrich, 3,912,770.

Kroon, Willem L.: *See—*
Schneider, Robert A.; and Kroon, Willem L., 3,913,143.

Kropac, Joseph M., to Xerox Corporation. Manifold imaging with thermal activator contained in a silica gel layer. 3,912,504, Cl. 96-1.00M.

Krouse, Wayne Lauron; and Miller, James Anton, to Deere & Company. Automatic brake release means. 3,912,057, Cl. 192-4.00C.

Kroy Industries Inc.: *See—*
Bluem, Gary R.; and Millman, Ronald W., 3,912,064.

Krups, Robert: *See—*
Limberg, Klaus, 3,911,573.

Kruschke, Melvin W., to Peterson Tractor Co. Hoist truck with planetary gear assemblies and load sensor means. 3,912,093, Cl. 214-75.00H.

Krynicki, Witold. Cassette holder. 3,912,077, Cl. 206-387.000.

Kubo, Masaharu: *See—*
Masaki, Akira; Kubo, Masaharu; and Chiba, Tsuneyo, 3,913,123.

Kubota, Josuke. Polarized light illumination device. 3,912,920, Cl. 240-9.500.

Kuboto Tekko Kabushiki Kaisha: *See—*
Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, 3,912,444.

Kuhn, Martin Clifford: *See—*
Buza, Thomas Brian; and Kuhn, Martin Clifford, 3,912,623.

Kuhn, Robert R.; and Machleder, Warren H., to Rohm & Haas Company. Alkyl ammonium carboxylate salt-ethoxylated alkyl phenol esters of a dimer or trimer acid. 3,912,771, Cl. 260-404.500.

Kuhnlein, Hans; Kogler, Georg; and Lanzendorfer, Rudolf, to Siemens Aktiengesellschaft. Speed control arrangement for a two reel rewinding apparatus. 3,912,990, Cl. 318-7.000.

Kujath, Klaus, to Frieseke & Hoepfner GmbH. Microwave moisture measuring system with reflection suppressing means. 3,913,012, Cl. 324-58.50A.

Kulbakh, Valter Osvaldovich; and Popova, Inesa Vladimirovna. N-methyl-d-clucosamine complex of 4-methyluracil, method for producing and use thereof. 3,912,714, Cl. 260-211.00R.

Kulp, Rodney J.: *See—*
Fridolph, John W.; Wilson, Robert W.; and Kulp, Rodney J., 3,911,766.

Kumins, Charles A., to Addressograph Multigraph Corporation. Light-sensitive diazotype film and method of making and using same. 3,912,512, Cl. 96-49.000.

Kumon, Osamu; and Saito, Nobuyuki, to Sumitomo Electric Industries, Ltd. Piezoelectric acoustic multiple tone generator. 3,912,952, Cl. 310-8.100.

Kumysh, Ilya Iosifovich: *See—*
Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich, 3,912,847.

Kunderman, Fred K.: *See—*
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Kunii, Daizo; and Kunugi, Taiseki. Continuous carbonization and gasification of particulate coal with double recirculation of fluidized particulate heat carrier. 3,912,465, Cl. 48-101.000.

Kunugi, Taiseki: *See—*
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Kunz, Bernard P. Apparatus for producing core material for honeycomb panels. 3,912,573, Cl. 156-471.000.

Kureha Kagaku Kogyo K.K.: *See—*
Murayama, Naohiro; and Oikawa, Takao, 3,912,830.

Kuykendall, Claude W., to Merchandising Associates, Inc. Balloon dispensing and filling machine. 3,911,974, Cl. 141-94.000.

Kwan, Okun; and Boyce, James John, to Bunker Ramo Corporation. Printer having document thickness compensating device. 3,912,068, Cl. 197-127.00R.

La Telemecanique Electrique: *See—*
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Laane, Rein Raymond: *See—*
Braun, Arthur Rechtman; Johnson, Clarence Newton; and Laane, Rein Raymond, 3,912,877.

Labofina S.A.: *See—*
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Lacon, John W., to Fiberglas Canada Limited. Method of and apparatus for forming articles of fibrous materials. 3,912,572, Cl. 156-381.000.

Lacotte, Jean Pierre; Le Carvennec, Francois; Le Merer, Jean Pierre; Malissin, Roland; and Peltier, Jean Paul, to Thomson-Brandt. Optical sensor for determining the focussing error in an optical illumination system embodying a projection lens. 3,912,922, Cl. 250-204.000.

Lacour, Jacques: *See—*
Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, 3,913,122.

Lagergren, Hans, to Lagergren, Hans. Endocardial electrode. 3,911,928, Cl. 128-418.000.

La Grouw, Coenraad Maria; van den Wittenboer, Cornelus Wilhelmus Theresia; and Hubers, Hendrik Jan, to U.S. Philips Corporation. Method of providing a sealed joint for joining parts of a vacuum vessel. 3,912,482, Cl. 65-43.000.

Lahiri, Syamal K., to International Business Machines Corporation. Thin film resistors and contacts for circuitry. 3,913,120, Cl. 357-5.000.

Lamatsch, Hans: *See—*
Albrecht, Cord; and Lamatsch, Hans, 3,913,044.

Lamb, Cedric St. John, to Wyld, Kenneth Barrington, a part interest. Parallel connected linear electric motor system. 3,912,992, Cl. 318-135.000.

Lambert, Lloyd J., Sr. Exercise machine. 3,912,261, Cl. 272-58.000.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,912,663, Cl. 252-542.000.

Lana, Giulio: *See—*
Alneri, Enzo; Bottaccio, Giorgio; Carletti, Vittorio; and Lana, Giulio, 3,912,778.

Landaud, Andre: *See—*
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Lande, Stanley H., to Newport News Shipbuilding and Dry Dock Company. Yankee dryer head and brace. 3,911,595, Cl. 34-110.000.

Lane, George C.; Curtis, Phyllis M.; and Michael, Arthur E., to Warner-Lambert Company. Cutting instruments and methods of making same. 3,911,579, Cl. 30-346.540.

Lanneau, Keith P.: *See—*
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Lantaires, Jacques: *See—*
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Lanzendorfer, Rudolf: *See—*
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Laporte Industries Limited: *See—*
Logan, William Reid; and Rippon, Alan, 3,912,766.

Larkin, Joseph F.; and Singer, Robert J., to TRW Inc. Feeding apparatus for body taped components. 3,911,646, Cl. 53-240.000.

Larson, Richard S.: *See—*
Westervelt, Peter J.; Larson, Richard S.; and Muir, Thomas G., 3,913,060.

Larson, Rodney L., to MTS Systems Corporation. Off center loading compensation for multiple actuator vibration table. 3,911,732, Cl. 73-71.600.

Larsson, Lars-Inge Bertil, to Aktiebolaget Gyproc. Doublewalled partition with insulating material therebetween. 3,911,636, Cl. 52-241.000.

LaRue, Mervin W., Jr.: *See—*
Mueller, Arthur C.; and LaRue, Mervin W., Jr., 3,913,115.

Lasier, Thomas R., to LCN Closers. Spring adjustment mechanism. 3,911,527, Cl. 16-64.000.

Lassiter, Rush E.; and Saizon, Floyd S., to Floyd Rush Corporation. Method for processing food wastes. 3,911,808, Cl. 100-38.000.

Lauber, Jean-Louis: *See—*
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Lavender, James A., Jr.: *See—*
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Weaver, Jeffrey L., 3,912,322.
Lawson, William J. Continuity and tone test set. 3,912,879, Cl. 179-175.000.
Lazdinsh, Arvid Avgustovich: *See—*
Giller, Solomon Aronovich; Zhuk, Regina Abramovna; Berzin, Anna Eduardovna; Sherin, Laima Avgustovna; and Lazdinsh, Arvid Avgustovich, 3,912,734.
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Leachman, Frank A., Jr. Heart assist device. 3,911,897, Cl. 128-1.00D.
Leachman, Frank A., Jr. Heart assist method and device. 3,911,898, Cl. 128-1.00D.
Lear Siegler, Inc., Krueger Division: *See—*
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Lee, Chen Yi: *See—*
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Lee, Larry E.: *See—*
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Lee, Seth, Jr. Combined engine exhaust and fuel gasification system for an internal combustion engine. 3,911,881, Cl. 123-122.0AB.
Leeman, Susan E.; Ki Chang, Michael Moon; Tregear, Geoffrey W.; and Niall, Hugh D. Synthetically produced undecapeptide, Substance P. 3,912,711, Cl. 260-112.500.
Leeming, Michael R. G.; Strike, Donald P.; and Kao, Wen-Ling, to American Home Products Corporation. Process for converting a type prostaglandins to E type prostaglandins. 3,912,725, Cl. 260-240.00R.
Leesona Corporation: *See—*
Bell, Charles C.; and Niederer, Kurt W., 3,911,657.
Lefebvre, Arthur Henry; and Norster, Eric Roy, to Parker-Hannifin Corporation. Method of liquid fuel injection, and to air blast atomizers. 3,912,164, Cl. 239-5.000.
Legal, Casimer Claudius: *See—*
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Leggett & Platt, Incorporated: *See—*
Higgins, Larry; and Zapletal, Henry, 3,911,511.
Lehmann, Hans; Girardin, Roger; Morf, William; and Delpretti, Roger, to Ateliers des Charmilles, S.A. Straightening device for wire electrode used in an electro-erosion machining apparatus. 3,912,899, Cl. 219-69.00V.
Lehrman, David, to Ironees Company, The. Ironing board cover. 3,911,603, Cl. 38-140.000.
Lehureau, Jean Claude; and Bricot, Claude, to Thomson-Brandt. Reading out and tracking a recorded diffractive trace with an elongated read out spot. 3,913,076, Cl. 340-173.0LT.
Leimgruber, Willy: *See—*
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Leitner, Lutz; Hund, Franz; and Rademachers, Jakob, to Bayer Aktiengesellschaft. Production of acicular magnetic iron oxides. 3,912,646, Cl. 252-62.560.
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Les Fabriques d'Assortiments Reunies: *See—*
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Lesser, Jerome M. Submarine electrical energy generating apparatus. 3,912,937, Cl. 290-43.000.
Leszczynski, Martin E.: *See—*
Anderson, Andrew W.; Leszczynski, Martin E.; and Mateyka, Milan, 3,912,191.
Letter, Eugene C.: *See—*
Howe, James D.; and Letter, Eugene C., 3,912,921.
Lever Brothers Company: *See—*
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Lamberti, Vincent, 3,912,663.
Levesque, Peter S.; and Gaertner, Max, to Fischer & Porter Company. Capacitive detector for an electronic differential pressure transmitter. 3,912,988, Cl. 317-249.00R.
Levi, Israel, to Northern Electric Company Limited. Capacitive coupling network. 3,912,878, Cl. 179-170.00R.
Levine, Barry; and Levine, David. Device for fastening ornamentation to flexible material. 3,911,722, Cl. 72-479.000.
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Levine, Barry; and Levine, David, 3,911,722.
Levinson, Lionel M., to General Electric Company. Photoconductive varistor. 3,913,055, Cl. 338-15.000.
Levinson, Lionel M., to General Electric Company. Varistors with patterned electrodes. 3,913,056, Cl. 338-21.000.
Lewis, Fielding H., Jr.; and Crawford, William C., to Wm. T. Burnett & Co., Incorporated. Arm protecting device. 3,911,497, Cl. 2-16.000.
Lewis, Gerald F. Safety pill containers. 3,912,073, Cl. 206-1.500.
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Libbey-Owens-Ford Company: *See—*
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Lichtenstein, Eric S. Apparatus for clinical laboratory sample collection and automatic sample processing. 3,912,455, Cl. 23-253.00R.
Liddel, William S., deceased; and by Liddell, Orval, executor. Three-dimensional image transmitting apparatus. 3,912,856, Cl. 178-6.500.
Liddell, Orval, executor: *See—*
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Liden, Thomas M.: *See—*
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Liebermann, Benno E. Spare tire carrier means. 3,912,099, Cl. 214-453.000.
Liebig, Heinrich. Double spreading dowel. 3,911,782, Cl. 85-67.000.
Lien, Charles R. Feed bunk support. 3,911,869, Cl. 119-61.000.
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Evans, Delme; Dunwell, David William; and Hicks, Terence Alan, 3,912,748.
Limberg, Klaus, to Krups, Robert. Dry shaver. 3,911,573, Cl. 30-43.920.
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Linde Aktiengesellschaft: *See—*
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Lindsay, James E. Coil for pressure gauge. 3,911,748, Cl. 73-418.000.
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Link Electric & Safety Control Company: *See—*
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Link, Gustav A. Sprinkler control system. 3,911,955, Cl. 137-624.200.
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Liquidometer Corporation: *See—*
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Lister, Glenn F. Temporary support device for a cement embedded anchor bolt. 3,912,218, Cl. 249-207.000.
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LKB-Produkter AB: *See—*
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Lockheed Electronics Co. Inc.: *See—*
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Lodge, Hilmer G., to Conflow Irrigation Systems. Irrigation system. 3,912,169, Cl. 239-110.000.
Lodi, Frank, to Fast Heat Element Manufacturing Co., Inc. Clamp and mounting electric heater with a cable. 3,912,907, Cl. 219-535.000.
Loebach, Donald C.: *See—*
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Logan, William Reid; and Rippon, Alan, to Laporte Industries Limited. Regeneration of degraded quinones for the production of hydrogen peroxide. 3,912,766, Cl. 260-369.000.

Logsdon, Hillard Glenn, to Aeronca, Inc. Low noise level air flow control unit. 3,911,958, Cl. 137-798.000.

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Lora, Thad A.: *See*—
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Lorenz, Horst; and Koch, Rolf Eckhard, to Th. Kieserling & Albrecht. Apparatus for straightening long metal workpieces. 3,911,708, Cl. 72-98.000.

Los Angeles Scientific Instrument Co., Inc.: *See*—
Coulbourn, Charles, 3,912,926.

Lou, Kingdon, to ICL/Scientific. Method for electroquantitative determination of proteins. 3,912,610, Cl. 204-180.00G.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See*—
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Lowe, Walter D.; and Pawlowski, Jacek, to Lunkenheimer. Pre-set pressure relief valve. 3,911,950, Cl. 137-543.170.

Lowell, Francis C., to Research Frontiers, Incorporated. Method and apparatus for maintaining the separation of plates. 3,912,365, Cl. 350-160.00R.

Lowry, Robert A., Jr., to Micro-Rel, Inc. Hybrid circuit handling and testing system. 3,912,983, Cl. 317-101.0CC.

LTV Aerospace Corporation: *See*—
Dell, Charles C.; Harms, A. D., Jr.; Knowles, Albert B.; Meredith, Fred D.; and Sutherland, Spurgeon, 3,912,198.

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Lucking, Hans Joachim; Seyfried, Klaus; Noll, Walter; and Fries, Ludwig, to Bayer Aktiengesellschaft. Process for brominating methylchlorosilanes. 3,912,604, Cl. 204-158.0HA.

Ludwig, Charles H.: *See*—
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Luebkeman, George C., to W. R. Weaver Company. Front sight construction for firearms. 3,911,607, Cl. 42-1.00S.

Luebkeman, George C., to W. R. Weaver Company. Molded binocular gun sight lens structure. 3,912,400, Cl. 356-247.000.

Lund, Frantz Johannes, to Lovens Kemiske Fabrik Produktionsaktieselskab. New 6-aminopenicillanic acid derivatives, methods for producing and compositions containing same. 3,912,751, Cl. 260-306.70C.

Lundberg, George A.; and Engesser, Carl, to E. J. Brooks Company. Hand operated seal press. 3,911,970, Cl. 140-93.400.

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Lutz, Gerhard; and Reiff, Karl, to Robert Bosch G.m.b.H. Hydraulic pump control arrangement. 3,912,419, Cl. 417-252.000.

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Ma, Kwok Chuen. Automatic egg roll making machine. 3,912,433, Cl. 425-126.00R.

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MacDonald, James E.; and Painter, Oliver K. Smokeless non-recovery type coke oven. 3,912,597, Cl. 202-102.000.

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Mackal, Glenn H. Lanyard handle, method of and apparatus for forming same. 3,911,762, Cl. 74-543.000.

MADAG Maschinen-und Apparatebau Dietikon AG: *See*—
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Maddox, Jim, Jr.; Tate, Jack F.; and Shupe, Russell D., to Texaco Inc. Secondary recovery method. 3,912,011, Cl. 166-271.000.

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Magee, John Storey, Jr.; and Daugherty, Raymond Preston, Jr., to W. R. Grace & Co. Preparation of cracking catalyst. 3,912,619, Cl. 208-120.000.

Magee, Vincent, to Ferranti, Limited. Solar cells. 3,912,539, Cl. 136-89.000.

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Mahan, James David: *See*—
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Maheu, Joseph S., to Raymond Lee Organization, Inc., The, a part interest. Snow blower vehicle. 3,911,601, Cl. 37-43.00R.

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Makover, Shraga; and Pruess, David Louis, to Hoffmann-La Roche Inc. Method for producing L-sorbosone. 3,912,592, Cl. 195-31.00R.

Malcolm, Donald H.; and Kramer, Matthew E., to Memorex Corporation. Multi-processor data processing system. 3,913,070, Cl. 340-172.500.

Malferrari, Corrado, to Modular S.p.A. Curtain formed of sliding sheets of cloth or the like. 3,911,991, Cl. 160-202.000.

Malissin, Roland: *See*—
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Malonda, Alphonse, to Bretigny Rectification. Precision control apparatus. 3,911,586, Cl. 33-174.00M.

Malooly, Robert J. Luggage case having hinged lid with auxiliary access door to file compartment therein. 3,912,055, Cl. 190-52.000.

Mandl, Gerhard, to Rieter Machine Works Ltd. Bearing arrangement for a spinning rotor of an open end spinning device. 3,911,659, Cl. 57-58.890.

Manker, Clifford O.; and McAlister, Craig L., to McGraw-Edison Company. Protector for electric circuits. 3,913,051, Cl. 337-279.000.

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Mann, Michael M. Optical multipactor. 3,912,367, Cl. 350-160.00R.

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Manning, Donald L., to General Motors Corporation. Wheelchair elevator for motor coach. 3,912,048, Cl. 187-9.00R.

Manning, Wellington M., Jr.: *See*—
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Mantelet, Jean, to Societe Anonyme Moulinex. Manually operated kitchen grater. 3,912,176, Cl. 241-93.000.

Manuel, James Edward. Course marker for cyclists. 3,911,854, Cl. 116-63.00P.

Manuel, James Edward. Course obstacle and wheel actuated signal for cyclists. 3,911,857, Cl. 116-132.00R.

Manuel, James Edward. Apparatus for timed events performed by cyclists. 3,912,259, Cl. 272-4.000.

Marans, Nelson S.; and Gluecksmann, Alfred, to W. R. Grace & Co. Process for curing a radiation composition comprising an epoxy compound and an amino acrylate. 3,912,608, Cl. 204-159.150.

Marble, Robert I., to Farr Company. Air filter for gaseous pollutants. 3,912,472, Cl. 55-484.000.

Marchwiak, Stanislaw: *See—*
Boratynski, Henryk; Kobylecki, Piotr; Kosicki, Zbigniew; Marchwiak, Stanislaw; and Marciniak, Jozef, 3,912,346.

Marciniak, Jozef: *See—*
Boratynski, Henryk; Kobylecki, Piotr; Kosicki, Zbigniew; Marchwiak, Stanislaw; and Marciniak, Jozef, 3,912,346.

Marcoux, Leo, to Texas Instruments Incorporated. Method of making heater assembly. 3,911,564, Cl. 29-611.000.

Marendaz, Georges-Andre: *See—*
Pfau, Jean; Rhyner, Heinz; and Marendaz, Georges-Andre, 3,912,898.

Marengoni, Claudio. Compoundable unit display window for the display of articles in general. 3,912,111, Cl. 220-84.000.

Mares, Trinidad; and Arthur, Jett C., Jr. Process for preparing water repellent cotton textiles and the product. 3,912,449, Cl. 8-120.000.

Marforio, Nerino, to Virginio Rimoldi and C. S.p.A. Guide and sewing device for fabric layers along a shaped edge. 3,911,840, Cl. 112-153.000.

Marinos, Danny; and Ripfel, Hans C. F., to United States of America, Energy Research and Development Administration. Hydraulic balancing of a control component within a nuclear reactor. 3,912,582, Cl. 176-36.00R.

Marisco, Joseph William, Jr.; and Goldman, Leon, to American Cyanamid Company. Novel sulfonate esters of 2-hydroxy-3-(methylthio)-1,4-naphthoquinone. 3,912,767, Cl. 260-396.00R.

Marks, Lawrence M., to Xerox Corporation. Electrophotographic process employing a compound document screen. 3,912,510, Cl. 96-1.00R.

Marondel, Guenther: *See—*
Gawlick, Heinz; and Marondel, Guenther, 3,911,825.

Marosi, Laszlo: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,912,775.

Marra, Dorethea C.: *See—*
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorethea C., 3,912,666.

Marra, Dorothea C.: *See—*
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 3,912,665.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 3,912,667.

Marsden, Jeffrey Lewis: *See—*
Dowrick, John Sydney; and Marsden, Jeffrey Lewis, 3,912,806.

Martens, Henry J.; and Vandebult, Jan, to I. D. Engineering, Inc. Anti-theft fastening device. 3,911,534, Cl. 24-150.00R.

Martin, Guy E.; Fahnestock, Melvin R.; Couchman, Richard; Mahan, Guy W.; Bundy, Hugh R.; and Pahl, Robert C., to Aluminum Company of America. Tube welding method. 3,912,151, Cl. 228-171.000.

Martin, Merrill D. Conveyor system for conveying sheets. 3,912,258, Cl. 271-184.000.

Martin, Robert L., to Ovation Instruments, Inc. Guitar construction. 3,911,778, Cl. 84-267.000.

Martinsson, Eva Margareta; Hellsten, Karl Martin Edvin; and Sterky, Anna Kristina, to Modokemi Aktiebolag. Liquid detergent composition containing an ampholytic betaine-type detergent. 3,912,662, Cl. 252-527.000.

Martonair Limited: *See—*
Boxall, Eric John, 3,911,947.

Maruya, Takayuki: *See—*
Kan, Masao; Ishii, Hirokazu; Murata, Yasuzo; Maruya, Takayuki; and Yamada, Akio, 3,912,831.

Maruyama, Masayuki: *See—*
Chiba, Ko; and Maruyama, Masayuki, 3,912,428.

Marvin Glass & Associates: *See—*
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Barlow, Gordon A., 3,912,273.
Hicks, Alan A.; and Meyer, Burton C., 3,912,272.
Morrison, Howard J.; and Terzian, Rouben T., 3,911,613.
Terzian, Rouben T., 3,911,614.

Marz, Joachim: *See—*
Vinnemann, Antonius; Marz, Joachim; and Lohse, Dieter, 3,912,862.

Marz, Louis R.: *See—*
Maxwell, Richard D.; Pink, John J.; Fitzharris, Michael J.; and Marz, Louis R., 3,911,692.

Masaki, Akira; Kubo, Masaharu; and Chiba, Tsuneyo, to Hitachi, Ltd. Bipolar type semiconductor integrated circuit. 3,913,123, Cl. 357-34.000.

Maschinenfabrik Augsburg-Nurnberg A.G.: *See—*
Schulz, Harry, 3,912,464.

Mason, Paul B., to Polaroid Corporation. Motion picture system. 3,912,382, Cl. 352-72.000.

Massachusetts Institute of Technology: *See—*
Kelsall, Dennis, 3,912,394.

Mateyka, Milan: *See—*
Anderson, Andrew W.; Leszczynski, Martin E.; and Mateyka, Milan, 3,912,191.

Mathis, Ronald D., to Phillips Petroleum Company. Nickel complex-hydroxybenzotriazole stabilizer system for polyolefins. 3,912,686, Cl. 260-45.75N.

Matsubara, Masaki: *See—*
Uetake, Toshifumi; Matsubara, Masaki; and Hayamizu, Yoshisada, 3,912,359.

Matsuda, Saburo: *See—*
Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi, 3,913,098.

Matsui, Hiroshi; and Mihara, Tadashi, to Matsushita Electric Industrial Co., Ltd. Variable resistor having front and back stages operated by concentric shafts coupled in rotary operation by friction through a spring. 3,913,059, Cl. 338-131.000.

Matsumoto, Takaaki; Nakamura, Takeshi; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Device for loading films into a radiographic film cassette. 3,912,932, Cl. 250-468.000.

Matsuno, Hiroshi: *See—*
Endo, Ichiro; Matsuno, Hiroshi; Kokado, Hiroshi; Inoue, Eiichi; Nishide, Katsuhiko; and Kinjo, Kikuo, 3,912,844.

Matsushita Electric Ind., Ltd.: *See—*
Ikeda, Mitsusuke; Sato, Hisanao; Torii, Etsuko; Morimoto, Kazuhisa; and Hasegawa, Yo, 3,912,508.

Matsushita Electric Industrial Co., Ltd.: *See—*
Deguchi, Masahiro; and Hashirano, Masaru, 3,913,132.
Matsui, Hiroshi; and Mihara, Tadashi, 3,913,059.
Sano, Kazuhiko; Nakagawa, Tokiharu; and Omiya, Shoji, 3,912,282.
Sasabe, Kaoru; and Hayami, Heijiro, 3,912,860.
Sugaya, Hiroshi; Ishihara, Takeshi; and Sawai, Kisuke, 3,912,483.
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Matsushita Electric Works, Ltd.: *See—*
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Matsuyama, Chiaki: *See—*
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Matsuzawa, Toshiaki: *See—*
Arai, Mamoru; Torikata, Akio; Fukatsu, Hisayoshi; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,912,811.

Matthews, Dean A., to Allis-Chalmers Corporation. Closed center hydraulic system with pump and accumulator output for high speed lift. 3,911,679, Cl. 60-413.000.

Mattone, Roberto; Sioli, Giancarlo; and Giuffre, Luigi, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Method for extracting lactams from acidic reaction mixtures. 3,912,721, Cl. 260-239.30A.

Maurice, Louis, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Molecular pump and method therefor. 3,912,415, Cl. 415-72.000.

Mauron, Gerard, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Blocking device for a vehicle belt. 3,911,535, Cl. 24-170.000.

Maximovich, Boleslav Ivanovich: *See—*
Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; Bykovets, Konstantin Petrovich; and Zavodyan, Vitaly Voitsekhovich, 3,911,859.

Maxwell, Albert H., Jr.: *See—*
Snyder, Carl J.; Maxwell, Albert H., Jr.; and Doby, William P., 3,913,129.

Maxwell, David A.: *See—*
Youmans, Albert P.; Allison, David F.; and Maxwell, David A., 3,913,121.

Maxwell, Richard D.; Pink, John J.; Fitzharris, Michael J.; and Marz, Louis R., to Amana Refrigeration, Inc. Exterior ice service for freezer-refrigerators. 3,911,692, Cl. 62-137.000.

May, Edward Gordon, to John Waddington Limited. Packing containers. 3,912,156, Cl. 229-37.00R.

Mays, Robert K.: *See—*
Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,912,649.

Mazur, Harry E. Fastener. 3,911,537, Cl. 24-245.000.

McAlister, Craig L.: *See—*
Manker, Clifford O.; and McAlister, Craig L., 3,913,051.

McBrian, John E., to Mosler Safe Company, The. Document removal and reinsertion detector. 3,913,087, Cl. 340-280.000.

McCafferty, James E., to Kingsbury, Inc. Thrust bearing assembly. 3,912,344, Cl. 308-160.000.

McCartan, Daniel A.: *See—*
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McCarthy, Jeremiah P.: *See—*
Geller, William L.; and McCarthy, Jeremiah P., 3,913,125.

McCarthy, William F.; and Myers, Phillip R., to International Business Machines Corporation. High resolution digitally programmable electronic delay for multi-channel operation. 3,913,021, Cl. 328-62.000.

McClure, Billy J.: *See—*
Kalb, Henry T.; Crosswy, Frank L.; McClure, Jim A.; Harding, Edward B.; McClure, Billy J.; and Inglish, Donnie J., 3,912,915.

McClure, Jim A.: *See—*
Kalb, Henry T.; Crosswy, Frank L.; McClure, Jim A.; Harding, Edward B.; McClure, Billy J.; and Inglish, Donnie J., 3,912,915.

McColl, Bruce J., to Owens-Illinois, Inc. Tree harvesting machine of a walking type. 3,911,980, Cl. 144-3.00D.

McConnell, Robert W.: *See—*
Tsigdinos, George A.; Hallada, Calvin J.; and McConnell, Robert W., 3,912,660.

McCormick, James, to Tenneco Inc. Pipe flange. 3,912,306, Cl. 285-12.000.

McCulloch Corporation: *See—*
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McCullough, John F.; and Sheridan, Richard C., to Tennessee Valley Authority. Ammonium polyphosphates. 3,912,802, Cl. 423-306.000.

McDonnell Douglas Corporation: *See—*
Jong, Howard W., 3,912,206.

McGahee, Welbourne D., to Loop-A-Line, Inc. Paper clip holder. 3,911,533, Cl. 24-73.00C.

McGann, Rodney, to Texaco Development Corporation. Method and article for distributing air in a regenerator. 3,912,460, Cl. 23-288.00B.

McGovern, Terence P.: *See—*
Eddy, Gaines W.; Davis, Harry G.; Beroza, Morton; and McGovern, Terence P., 3,912,810.

McGrath, James L., to Reliable Electric Company. Gripper with center pull feed through release member. 3,912,406, Cl. 403-19.000.

McGraw-Edison Company: *See—*
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Manker, Clifford O.; and McAlister, Craig L., 3,913,051.

McHeffey, Murray Parker, to Extrudart Metal Products Inc. Multipurpose window. 3,911,621, Cl. 49-192.000.

McInerny, George P., to Pennsylvania Research Associates, Inc. Stackers for document counters and the like. 3,912,255, Cl. 271-80.000.

McIntire, Daryl C.; and Clark, Oran. Particulate material circulating means. 3,911,594, Cl. 34-102.000.

McIntosh, Harold A.; and Hull, Bradford N., to Robertshaw Controls Company. Circuit for electric heating system. 3,912,906, Cl. 219-486.000.

McIntyre, Jefferson A., Jr.: *See—*
Cooke, Ralph C.; and McIntyre, Jefferson A., Jr., 3,912,085.

McKay, James J.: *See—*
Brundage, John F.; and McKay, James J., 3,912,018.

McKown, Gary L.; and Ambrosini, Leonard R., to United States of America, Army. Laser-guided ring airfoil projectile. 3,912,197, Cl. 244-3.130.

McLaughlin, Albert T.: *See—*
Homberg, John A.; McLaughlin, Albert T.; Melus, John J.; Pinheiro, Edwin J.; Recks, John A.; and Rittenburg, George, 3,913,074.

McNeil, William J. Drawing board guides for parallel ruling straightedge. 3,911,585, Cl. 33-80.000.

McQueen, Malcolm M. Seal. 3,911,957, Cl. 137-625.480.

McStravick, David M.: *See—*
Crowe, Talmadge L.; Chenoweth, David V.; and McStravick, David M., 3,912,026.

Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich. Device for securing an electrode and supplying electric current thereto. 3,912,847, Cl. 13-16.000.

Medtronic, Inc.: *See—*
Gobeli, David H., 3,911,929.

Meeker, Joseph Fitzpatrick; Keen, Michael Donahoo; Lee, Larry E.; and LeJeune, Roderick Charles, to Drilling Systems International, Inc. Motion compensation and/or weight control system. 3,912,227, Cl. 254-172.000.

Meeks, Crawford R., Jr., to Hughes Aircraft Company. Liquid dispenser. 3,912,129, Cl. 222-189.000.

Mehdizadeh, Parviz, to Continental Oil Company. Detecting incipient fatigue damage in metal. 3,911,734, Cl. 73-91.000.

Meier, Ernst, to Stopinc Aktiengesellschaft. Aligning ring for refractory brick and sleeve of sliding gate. 3,912,135, Cl. 222-561.000.

Meihofer, Edward F., to Butler Automatic, Inc. Web tension control system. 3,912,145, Cl. 226-44.000.

Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, to Bayer Aktiengesellschaft. 1-Substituted-1,2,4-triazoles. 3,912,752, Cl. 260-308.00R.

Meister, Kurt: *See—*
Bruck, Rolf; and Meister, Kurt, 3,912,186.

Meisterring, Reinhold, to Gebr. Saacke K.G. Profile-machining tool. 3,911,544, Cl. 29-102.00R.

Melchiore, John J.: *See—*
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Melus, John J.: *See—*
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Membrino, Robert J.; and Ridgell, James J., Jr., to Singer Company, The. Communication monitoring system. 3,912,884, Cl. 179-175.30R.

Membrino, Robert J., to Singer Company, The. Pseudo noise modulator. 3,913,031, Cl. 331-78.000.

Memorex Corporation: *See—*
Malcolm, Donald H.; and Kramer, Matthew E., 3,913,070.

Menzi, Ulrich, to Hermes Precisa International S.A. Typewriter spacing selection and control mechanism. 3,912,067, Cl. 197-84.00R.

Mercer, Robert L.; and Boor, Roger M., to General Motors Corporation. Door latch assembly with vertically moved microswitch engaged by striker. 3,912,891, Cl. 200-61.670.

Merchandising Associates, Inc.: *See—*
Kuykendall, Claude W., 3,911,974.

Merck & Co., Inc.: *See—*
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Merckel, Gerard: *See—*
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Meredith, Fred D.: *See—*
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Mermi, Kurt; Schmelzle, Wolfgang; Bappert, Adolf; and Tutsch, Werner, to Upat-Max Langensiepen KG. Fixing clamp for securing fin, tube or like radiators of all kinds to a wall or like surface. 3,912,213, Cl. 248-233.000.

Merrick, Howard Francis: *See—*
Schultz, Jay Ward; and Merrick, Howard Francis, 3,912,552.

Merrill, Stewart H., to Eastman Kodak Company. Photoconductive elements containing polymeric binders. 3,912,506, Cl. 96-1.500.

Mertler, Charles S. Thermostatic switch. 3,913,048, Cl. 337-67.000.

Messerschmitt-Bolkow-Blohm G.m.b.H.: *See—*
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Meteor-Siegen: *See—*
Schweisfurth, Werner, 3,912,570.

Meteor-Siegen Apparatebau Paul Schmeck GmbH, Firma: *See—*
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Meyer, Burton C.: *See—*
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Meyer, Martin H.: *See—*
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Michael, Arthur E.: *See—*
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Michael Reese Hospital and Medical Center: *See—*
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Michel, Frank, to Pfizer Inc. Bottle sealing cap. 3,912,102, Cl. 215-249.000.

Mickiewicz, Stanley P.: *See—*
Sodickson, Lester A.; and Mickiewicz, Stanley P., 3,912,452.

Micko, Karl. Gymnastic, recreational and instructional apparatus. 3,912,262, Cl. 272-60.00R.

Micro-Rel, Inc.: *See—*
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Midland Industries, Ltd.: *See—*
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Mietens, Gerhard; and Ahlgrim, Michael, to Hoechst Aktiengesellschaft. Electrolytic bath for the removal of metals. 3,912,603, Cl. 204-146.000.

Mihara, Tadashi: *See—*
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Mikami, Ichiro; Sugai, Hidesuke; Tsujikura, Yosuke; and Ebisaka, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Pilot wire protective relaying apparatus. 3,912,979, Cl. 317-27.00A.

Mikawa, Hiroji; Kato, Yomei; and Sasaki, Kiyoshi, to Hitachi, Ltd. Air separating apparatus. 3,912,476, Cl. 62-37.000.

Mikulecky, Harvey W., to RTE Corporation. Fuse assembly for current limiting fuses. 3,913,050, Cl. 337-159.000.

Mikulecky, Harvey W.: *See—*
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Milde, Helmut I.: *See—*
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Miles Laboratories, Inc.: *See—*
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Millard, Maurice; Trzeciak, John R.; and Woycechowsky, Brian J., to Singer Company, The. Synthetic terrain generator. 3,911,597, Cl. 35-12.00N.

Miller, Arthur. Multiple range torque measuring tool. 3,911,736, Cl. 73-139.000.

Miller, Carl Wayne: *See—*
Hammond, Robert James; Miller, Carl Wayne; and Culver, Larry Fred, 3,912,283.

Miller, Elmer L. Heavy-duty loader for quick assembly on a tractor. 3,912,095, Cl. 214-131.00A.

Miller, George E.; and Griffith, Michael J., to Outboard Marine Corporation. Water jacketed exhaust relief system. 3,911,852, Cl. 115-17.000.

Miller, James Anton: *See—*
Krouse, Wayne Lauron; and Miller, James Anton, 3,912,057.

Miller, Max W., to Pfizer Inc. 2-Phenyl-as-triazine-3,5(2H,4H)diones. 3,912,723, Cl. 260-239.700.

Miller, Michael Evans, to RCA Corporation. Stylus arm pivot. 3,912,857, Cl. 178-6.60A.

Miller, Paul W.; Fobes, Norman H.; Thompson, Edward J.; Redman, Eugene K.; and Lavender, James A., Jr., to Wean United, Inc. Method and apparatus for guiding strand-like materials. 3,912,143, Cl. 226-3.000.

Miller, Ralph L.: *See—*
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Miller, Roger D.; and Gilbert, Maurice M. Aluminum alloy compression type connectors for use with aluminum or copper conductors. 3,912,358, Cl. 339-276.00T.

Miller, Ward B.; and McCartan, Daniel A., to Owens-Corning Fiberglas Corporation. Roll-up compressive packaging apparatus. 3,911,641, Cl. 53-21.0FW.

Millman, Ronald W.: *See—*
Bluem, Gary R.; and Millman, Ronald W., 3,912,064.

Mills, Ivor W.; and Melchiore, John J., to Sun Oil Company of Pennsylvania. Blended refrigeration oil composition. 3,912,617, Cl. 208-14.000.

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Minchenko, Alexei Andreevich. Covering for an aluminium cell with burnt anodes. 3,912,615, Cl. 204-243.00R.
Minnesota Mining and Manufacturing Company: *See—*
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Edberg, Ralph C., 3,912,840.
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Missman, Robert C.; and Sinclair, Carter, to General Electric Company. Water cooled heat sink assembly. 3,912,001, Cl. 165-80.000.
Mitchell, Michael D., to Formac International, Inc. Cable hauling system with hydraulic differential. 3,912,229, Cl. 254-185.0AB.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsui, Ryozo: *See—*
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Mitsuishi, Yoshiji; and Uchida, Tomio, to Caterpillar Tractor Company. Collapsible canopy assembly. 3,912,297, Cl. 280-150.00C.
Miyajima, Tamotsu; Enami, Shigekazu; Murai, Takamaru; and Kobayashi, Katsuhiko, to Pilot Pen Company, Ltd., The. Writing ink for writing boards. 3,912,520, Cl. 106-22.000.
Miyamoto, Akio: *See—*
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Miyamoto, Koichi, to Canon Kabushiki Kaisha. Copy medium receiving tray. 3,912,389, Cl. 355-3.00R.
Miyashita, Tsuneo; Nayuki, Toshio; Sano, Kazuo; Yamada, Takeo; Ohzeki, Shoichiro; and Nishio, Hiroaki, to Nippon Kokan Kabushiki Kaisha. Method of preparing reducing gas. 3,912,502, Cl. 75-42.000.
Miyata, Ichiro: *See—*
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Miyauchi, Toshiyuki: *See—*
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Mo, Olav. Foundation method for caissons. 3,911,687, Cl. 61-46.500.
Model, Ernst; von der Crone, Jost; and Pugin, Andre, to Ciba-Geigy Corporation. Arylazo-iminoisoindolinone dyestuffs. 3,912,710, Cl. 260-165.000.
Modenov, Vitaly Pavlovich: *See—*
Vereschagin, Leonid Fedorovich; Semerchian, Aik Akopovich; Modenov, Vitaly Pavlovich; Bocharova, Tamara Timofeevna; and Dmitriev, Mikhail Eremeevich, 3,912,500.
Modokemi Aktiebolag: *See—*
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Monbaliu, Marcel Jacob; Benoy, Gaston Jacob; Van Poucke, Raphael Karel; Sauerteig, Wolfgang; Stieler, Dieter; and De Cat, Arthur Henri, to Agfa-Gevaert N.V. Polymeric competing couplers and their use in photographic silver halide colour materials. 3,912,513, Cl. 96-56.500.
Monden, Yoshinobu: *See—*
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Morehouse, Melvin D. Automobile deceleration warning system. 3,912,892, Cl. 200-61.890.
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Morrison, Howard J.; and Terzian, Rouben T., to Marvin Glass & Associates. Articulated figure toy and accessories. 3,911,613, Cl. 46-116.000.

Moser, Hans; and Vogel, Christian, to Ciba-Geigy Corporation. 2,5-Dioxo-imidazolidines as selective herbicides. 3,912,495, Cl. 71-90.000.

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Moylan, Philip John, to Bell Telephone Laboratories, Incorporated. Programmable switching array. 3,912,914, Cl. 235-152.000.

Moyse, Gaston, to Moyse S.A. Linear-induction motor with continuous active track. 3,912,991, Cl. 318-135.000.

Moyse S.A.: *See—*
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Muir, Thomas G.: *See—*
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Mukawa, Fumikazu, to Shionogi & Co., Ltd. Novel 6β-amino-steroids and production thereof. 3,912,722, Cl. 260-239.500.

Mulder, Cornelis; and Sangster, Frederik L. J., to U.S. Philips Corporation. Integrated bucket brigade memory using transistor barrier capacitors for storage. 3,912,944, Cl. 307-238.000.

Mullen, John H.; and Kellogg, Walter J., to Westinghouse Electric Corporation. Convertible switch. 3,912,894, Cl. 200-153.0LA.

Mullendore, David L., to Price Brothers Company. Method and apparatus for wrapping a bevel pipe core. 3,912,181, Cl. 242-7.020.

Muller, Jean Jacques, to International Standard Electric Corporation. Frequency division switching network. 3,912,876, Cl. 179-41.00A.

Muller, Rolf, to Papst-Motoren KG. Direct-current motor. 3,912,956, Cl. 310-68.00C.

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Heinrich, Ernst; and Muller, Rolf, 3,912,745.

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Murai, Takamaru: *See—*
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Murata, Junichi; and Takasuga, Yutaka, to Bridgestone Tire Company Limited. Apparatus for printing a mark on a rotating tire. 3,911,739, Cl. 73-146.000.

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Murayama, Naohiro; and Oikawa, Takao, to Kureha Kagaku Kogyo K.K. Method of producing a piezoelectric or pyroelectric element. 3,912,830, Cl. 427-100.000.

Murogov, Viktor Mikhailovich: *See—*
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Murphy, Richard A.: *See—*
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Murray, Dudley Charles; and Elstow, William Rupert Brooke, to Pains-Wessex Limited. Pyrotechnic devices. 3,911,823, Cl. 102-86.500.

Musitronics Corporation: *See—*
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Musselman, Camillus B.; and Bovier, Edward M., to Anheuser-Busch, Incorporated. Water resistant corrugating adhesive composition. 3,912,530, Cl. 106-213.000.

Musselman, Camillus B.; and Bovier, Edward M., to Anheuser-Busch, Incorporated. Corrugating adhesive composition. 3,912,531, Cl. 106-213.000.

Muta, Akinori; and Tsukuda, Yasuo, to Hitachi, Ltd. High pressure sodium vapor discharge lamps. 3,912,959, Cl. 313-220.000.

Myeress, Rudolph, to Allied Steel & Tractor Products, Incorporated. Adjustable support base for a field measurement device. 3,911,589, Cl. 33-286.000.

Myers, John H.; and Waleck, Edward, to Federal Paper Board Company, Inc. Package forming machine. 3,911,644, Cl. 53-207.000.

Myers, Lester Alvin. Quick release tool holder support. 3,911,767, Cl. 82-37.000.

Myers, Phillip R.: *See—*
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N. Worthing & Co. Ltd.: *See—*
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Nadaud, Yvon: *See—*
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Nagahara, Masao; Tatsudan, Masateru; Hidaka, Yoshihiro; and Yoshida, Minoru, to Japan Steel Works Ltd. Method and apparatus for adjusting the position of cutter blades relative to a die in a plastic resin pelletizing apparatus. 3,912,434, Cl. 425-142.000.

Nagahara, Yasumori, to Ricoh Co., Ltd. Sheet stripping device for an electrophotographic copying apparatus. 3,912,256, Cl. 271-174.000.

Nagai, Nobuo: *See—*
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Nagasawa, Masao, to Nippondenso Co., Ltd. Ignition system for an internal combustion engine. 3,911,886, Cl. 123-148.00R.

Nagasawa, Masao, to Nippondenso Co., Ltd. Capacitor discharge type contactless ignition system for internal combustion engines. 3,911,889, Cl. 123-148.00R.

Nakada, Kusuo: *See—*
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Nakadaira, Isamu; and Saito, Takashi, to Victor Company of Japan, Limited. Automatic mechanism for use in phonograph. 3,912,280, Cl. 274-1.00L.

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Nakai, Kenichi; and Nishimura, Hiroshi, to Matsushita Electric Works, Ltd. Discharge lamp lighting apparatus. 3,912,969, Cl. 315-278.000.

Nakai, Toshitsugu: *See—*
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Nakajima, Tomio; Nakano, Masashi; Uchida, Takashi; and Kishi, Kenichi, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive material. 3,912,515, Cl. 96-84.00R.

Nakamura, Takeshi: *See—*
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Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi, to Hayakawa Denki Kogyo Kabushiki Kaisha. Light emitting four layer device and improved circuitry thereof. 3,913,098, Cl. 340-384.00E.

Nakamura, Zenzo, to Canon Kabushiki Kaisha. Flash tube discharge-producing circuit. 3,912,968, Cl. 315-241.00P.

Nakano, Masashi: *See—*
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Nally, Phillip L. Storm window. 3,911,630, Cl. 52-2.000.

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Naumovski, Vera. Sport shirt. 3,911,500, Cl. 2-115.000.

Naylor, Geoffrey, to Ernest Scragg & Sons Limited. Yarn friction false twist device. 3,911,661, Cl. 57-77.400.

Nayuki, Toshio: *See—*
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Necchi Societa per Azioni: *See—*
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Neuser, Rolf Dieter: *See—*
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Newman, Ritchey O., Jr., to Dow Chemical Company, The. Strand extrusion apparatus. 3,912,439, Cl. 425-308.000.
Newport News Shipbuilding and Dry Dock Company: *See—*
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NGK Spark Plug Co., Ltd.: *See—*
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Nickel, Robert J. Golf tee sharpener. 3,911,577, Cl. 30-241.000.
Nicolas, Yves; and Landaud, Andre, to Schlumberger Technology Corporation. Flow meter apparatus. 3,911,743, Cl. 73-229.000.
Nicotra, William A. Motorcycle and container carrier for vehicles. 3,912,098, Cl. 214-450.000.
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Nielsen, Jacob August, to Crisplant A/S. Conveyor system having selective lateral delivery. 3,912,071, Cl. 198-38.000.
Nielsen, Paul I.: *See—*
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Niklas, Ludwig, to Krautkramer-Branson, Incorporated. Ultrasonic transducer probe system. 3,911,730, Cl. 73-67.700.
Nilsson, Alvar Erling, to Pelly AB. Goods containers. 3,911,826, Cl. 104-135.000.
Nilsson, Karl-Ivar, to AB Instrument-Verken. Locking device for vehicle safety harnessess. 3,912,177, Cl. 242-107.400.
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Nishio, Keizi; Sasaki, Takashi; Araki, Kunio; and Fukushima, Masatoshi, to Japan Atomic Energy Research Institute. Radiation cross-linked vinyl chloride resin. 3,912,605, Cl. 204-159.140.
Nishio, Shinji; Ushida, Yoshiro; and Nozaki, Shunkichi, to NGK Spark Plug Co., Ltd. Thermosensor. 3,913,058, Cl. 338-28.000.
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Noel, John A. Apparatus for molding beads expandable and formable under heat and pressure. 3,912,430, Cl. 425-4.00R.
Nohynek, Odon; to Driam Metallprodukt GmbH & Co. KG, Firma. Device for the continuous production of dragees. 3,911,860, Cl. 118-6.000.
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Nolli, Luigi, to Necchi Societa per Azioni. Automatic apparatus for making piped or welted pockets. 3,911,838, Cl. 112-70.000.
Nolte, Karl-Heinz, to Herbert Kannegiesser Kommanditgesellschaft, Firma. Device for folding shirts or similar articles of clothing for packing. 3,912,136, Cl. 223-37.000.
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Ostberg, Jan-Erik; and Noren, Sven Anders, 3,912,237.
Norlander, Lars Ako Wilhelm. Means for constructing a floor or ceiling with joists. 3,912,217, Cl. 249-31.000.
Norlin Music, Inc.: *See—*
Rendell, Stanley E., 3,911,777.
Norster, Eric Roy: *See—*
Lefebvre, Arthur Henry; and Norster, Eric Roy, 3,912,164.
North American Philips Corporation: *See—*
Kalisvaart, Adri C., 3,912,949.
Kenney, George Churchill, 3,912,858.
North Electric Company: *See—*
Battocletti, Frank E., 3,912,871.
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Northern Electric Company Limited: *See—*
Levi, Israel, 3,912,878.
Northrup, James L.: *See—*
Northrup, Leonard L., Jr.; and Northrup, James L., 3,912,903.
Northrup, Leonard L., Jr.; and Northrup, James L. Electrical heating device for air duct. 3,912,903, Cl. 219-375.000.
Northwest Engineering Service, Inc.: *See—*
Crombie, Allen P.; and Steege, Roy M., 3,911,953.
Norton, Elizabeth J.: *See—*
Giacobbe, Thomas J.; and Norton, Elizabeth J., 3,912,717.
Norwood Mills, Inc.: *See—*
Buckholtz, Eric A.; and Randell, Werner M., 3,911,696.
Nosanov, Valentin Alexandrovich: *See—*
Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich, 3,912,847.
Novo Industri A/S: *See—*
Slott, Steen; and Madsen, Gerda Bente, 3,912,590.
Nowack, Gerhard P.; and Johnson, Marvin M., to Phillips Petroleum Company. Selective partial hydrogenation of aromatics. 3,912,787, Cl. 260-667.000.
Nozaki, Shunkichi: *See—*
Nishio, Shinji; Ushida, Yoshiro; and Nozaki, Shunkichi, 3,913,058.
Numagami, Kiyoshi; Okuyama, Toshiki; and Kato, Tadanari, to Nissan Motor Company Limited. Method of preparing catalyst carrying metallic catalyst. 3,912,661, Cl. 252-466.0PT.
Nuova San Giorgio S.p.A.: *See—*
Piro, Mario, 3,911,695.
Nussbaumer, Henri, to International Business Machines Corporation. Digital filter. 3,912,917, Cl. 235-156.000.

Nussel, Hans-Georg: *See—*
Wilke, Gunther; Bogdanovic, Borislav; and Nussel, Hans-Georg, 3,912,786.

Nutter, Benjamin P., to Schlumberger Technology Corporation. Side-wall anchor apparatus. 3,912,006, Cl. 166-216.000.

Nyeste, Zoltan P., to Worthington-Cei Incorporated. Multi-cooling housing for a multi-stage compressing system. 3,912,000, Cl. 165-47.000.

O. M. Scott and Sons Company: *See—*
Ferguson, Fred Eugene; and Bell, Robert J., 3,912,814.

O'Brien Corporation, The: *See—*
Huemmer, Thomas F.; and Plooy, Ronald J., 3,912,670.

Obstfelder, Guenther: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrmann, Victor, 3,912,196.

Oce-van der Grinten N.V.: *See—*
van Herten, Jozef Marie, 3,912,390.

Ocean Drilling & Exploration Company: *See—*
Petty, Terry; Costello, Carmon R.; Bell, John L.; Childers, Mark A.; and Rao, Gude P., 3,912,228.

Ochi, Shikanosuke, to Kabushiki Kaisha Sega Enterprises. Step-feed device. 3,912,910, Cl. 235-92.00C.

Ochiai, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Antiskid apparatus. 3,912,337, Cl. 303-21.00P.

Odaka, Toyokazu: *See—*
Kouyama, Masaharu; Nakada, Kusuo; Odaka, Toyokazu; and Miyamoto, Akio, 3,912,964.

Odawara, Yooji: *See—*
Iijima, Tokuji; Odawara, Yooji; and Yamaguchi, Tetsuo, 3,912,585.

Oertel, Harald; Zorn, Bruno; Koch, Hans Joachim; Berndt, Gerhard; and Noll, Klaus, to Bayer Aktiengesellschaft. Light fast polyurethane urea coating solutions. 3,912,680, Cl. 260-29.2TN.

Oesau, Robert J. Electro-splint for relieving involuntary muscular spasticity. 3,911,910, Cl. 128-82.100.

Oestreich, Ulrich, to Siemens Aktiengesellschaft. Press extruder for processing thermoplastic materials. 3,912,241, Cl. 259-191.000.

O'Farrell, Charles P., to Exxon Research and Engineering Company. Process for the preparation of sulfobutyl latex. 3,912,683, Cl. 260-29.70B.

Officine Meccaniche Danieli: *See—*
Poran, Michael, 3,912,134.

Ogata, Koichi: *See—*
Kaneyuki, Hiroo; and Ogata, Koichi, 3,912,586.

Ogawa, Yasunao; Yonetani, Yukio; Maekawa, Hideyuki; and Ishitobi, Kaoru, to Shionogi & Co., Ltd. Test strip for hepatic diseases. 3,912,457, Cl. 23-253.0TP.

Ogino, Shuzi: *See—*
Ogura, Toshinobu; and Ogino, Shuzi, 3,912,376.

Ogura, Toshinobu; and Ogino, Shuzi, to Minolta Camera Kabushiki Kaisha. Zoom lens system capable of macro-photography. 3,912,376, Cl. 350-186.000.

Ohashi, Tsuyoshi; Taniguchi, Hiroshi; Wakihira, Koichiro; and Kakihara, Kunio, to Kobe Steel Ltd. Hob for machining gear wheels. 3,911,545, Cl. 29-103.00B.

Ohde, Mitsuru: *See—*
Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, 3,912,444.

Ohnaka, Makoto, to Shiroyama Kogyo Kabushiki Kaisha. Vacuum suction type manipulator. 3,912,317, Cl. 294-64.00R.

Ohneda, Shoichi, to Minolta Camera Kabushiki Kaisha. Optical marker. 3,911,588, Cl. 33-286.000.

Ohno, Tomeji: *See—*
Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, 3,912,527.

Ohtsuka, Kunio: *See—*
Iwanaga, Kazuyoshi; Kawamoto, Tamio; Miyauchi, Toshiyuki; and Ohtsuka, Kunio, 3,912,050.

Ohzeki, Shoichiro: *See—*
Miyashita, Tsuneo; Nayuki, Toshio; Sano, Kazuo; Yamada, Takeo; Ohzeki, Shoichiro; and Nishio, Hiroaki, 3,912,502.

Oikawa, Takao: *See—*
Murayama, Naohiro; and Oikawa, Takao, 3,912,830.

Okai, Hiroshi: *See—*
Kondo, Renichi; Nakagawa, Koji; Fukuda, Makoto; Okai, Hiroshi; and Kishi, Ikuji, 3,912,671.

Okubo, Kazuo: *See—*
Ueno, Hiroshi; Kawasaki, Fumio; Sasaya, Minoru; and Okubo, Kazuo, 3,912,568.

Okuyama, Toshiki: *See—*
Numagami, Kiyoshi; Okuyama, Toshiki; and Kato, Tadanari, 3,912,661.

Olginsky, Felix Yanovich: *See—*
Sharanov, Mikhail Alexeevich; Silukov, Gennady Alexeevich; Khainovsky, Valentin Petrovich; Olginsky, Felix Yanovich; Solovykh, Vladimir Alexeevich; and Sukhorukov, Alexandr Efimovich, 3,912,487.

Olin Corporation: *See—*
Ford, James M., 3,912,616.
Tepas, Joseph J., Jr., 3,912,627.

Olinkraft, Inc.: *See—*
Graser, Earl J., 3,912,157.

Olivani, Franco: *See—*
Galli, Riccardo; and Olivani, Franco, 3,912,536.

Olson, Joyce L.; and Lazorcak, Stephen A., Jr., to Olson, Joyce L. Remote control apparatus for television receivers. 3,911,752, Cl. 74-10.00A.

Olsson, Jonses Karl Erik, to Lihnell Vagn AB. Automatic stabilizing system. 3,912,246, Cl. 267-11.00R.

Olwert, Ronald J., to General Electric Company. Precoat for reprographic lamps having oxide reflector coatings. 3,912,828, Cl. 427-67.000.

Olympia Werke AG: *See—*
Rix, Albert; Fuchs, Hans; Moritz, Rolf; and Onuscheit, Jens, 3,911,757.

Olympus Optical Co., Ltd.: *See—*
Goto, Atsuo, 3,912,378.
Uetake, Toshifumi; Matsubara, Masaki; and Hayamizu, Yoshisada, 3,912,359.

O'Mahony, John P.: *See—*
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,818.
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,819.
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,820.
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,821.

Omiya, Shoji: *See—*
Sano, Kazuhiko; Nakagawa, Tokiharu; and Omiya, Shoji, 3,912,282.

Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, to Nisshin Seiko Kabushiki Kaisha; Shin-Nippon Seitetsu Kabushiki Kaisha; Fuji Denki Seizo Kabushiki Kaisha; and Kuboto Tekko Kabushiki Kaisha. Method for operating hot blast stove. 3,912,444, Cl. 432-30.000.

Onuscheit, Jens: *See—*
Rix, Albert; Fuchs, Hans; Moritz, Rolf; and Onuscheit, Jens, 3,911,757.

Opocensky, Willard John: *See—*
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Ordemann, Connie R. Bicycle drive apparatus. 3,912,039, Cl. 180-33.00D.

O'Riley, Kenneth Walter, to Vickers Limited. Apparatus for supporting a length of sheeting at a working site. 3,912,146, Cl. 226-95.000.

Ormond, Alfred Newman. Heavy duty load cell. 3,911,737, Cl. 73-141.00A.

Osipow, Lloyd I.: *See—*
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 3,912,665.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorethea C., 3,912,666.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C., 3,912,667.

Ost, Walter; Thomas, Klaus; Amadori, Ekkehard; and Darskus, Rolf, to Celamerck GmbH & Co. KG. Isomers of N,N'-bis-[(1-formamido-2,2,2-trichloro)-ethyl]-piperazine and method of isolating the same. 3,912,738, Cl. 260-268.00R.

Ostberg, Jan-Erik; and Noren, Sven Anders, to Ostberg, Jan-Erik. Method and apparatus for moving of liquid phases in industrial processes. 3,912,237, Cl. 259-112.000.

Otten, Walter; and Stacker, Gunther, to U.S. Philips Corporation. Line deflection circuit for cathode-ray tubes. 3,912,972, Cl. 315-411.000.

Otto, Ted: *See—*
Raffetto, Michael J.; Otto, Ted; and Opocensky, Willard John, 3,913,142.

Outboard Marine Corporation: *See—*
Hackbarth, Eugene R., 3,911,870.
Miller, George E.; and Griffith, Michael J., 3,911,852.
Payne, Guy D., 3,912,030.
Strang, Charles D., 3,911,853.

Ovation Instruments, Inc.: *See—*
Martin, Robert L., 3,911,778.

Overton, Harold C., to Republic Steel Corporation. Bearing chocking assembly for mill rolls. 3,912,345, Cl. 308-207.00R.

Owada, Akihito: *See—*
Sugahara, Eisuke; Yagi, Yusaku; and Owada, Akihito, 3,911,952.

Owen, Charles F., to United States of America, Navy. Antenna erection mechanism. 3,913,109, Cl. 343-880.000.

Owens-Corning Fiberglas Corporation: *See—*
Brady, William C.; and Giles, William F., 3,912,477.
Jauch, Ewald H.; and Heubach, Edward C., 3,912,486.
Miller, Ward B.; and McCartan, Daniel A., 3,911,641.
Roberson, Cletis L., 3,912,479.

Owens-Illinois, Inc.: *See—*
Berry, James W., 3,912,075.
Dietz, Earl D., 3,911,581.
Graham, Paul W. L.; Moore, Thomas W., Jr.; and Mann, Charles F., 3,912,100.
McColl, Bruce J., 3,911,980.

Oxy-Catalyst, Incorporated: *See—*
Smithson, Harold R.; and Stirton, Jerry Allen, 3,911,971.

Pacific Fabrication, Inc.: *See—*
LeBreton, Edward T.; and Wiltshire, Arthur J., 3,911,956.

Pacifici, James G.; and Kelly, Charles A., to Eastman Kodak Company. Photosensitive compositions containing benzoxazole sensitizers. 3,912,606, Cl. 204-159.150.

Pacifici, James G., to Eastman Kodak Company. Light-sensitive polymers. 3,912,697, Cl. 260-79.5NV.

Packaging Coordinators, Inc.: *See—*
Gerner, Daniel F.; and Sauter, Richard S., 3,912,082.

Paco Packaging, Inc.: *See—*
Haines, Russell R.; and Zimmerman, Walter, 3,912,081.

Padovani, Pietro. Container manufacturing apparatus. 3,912,438, Cl. 425-292.000.

Paessler, Ernst-Robert: *See—*
Grun, Artur; Paessler, Ernst-Robert; and Smutny, Kurt, 3,912,916.

Pahl, Robert C.: *See—*
Martin, Guy E.; Fahnestock, Melvin R.; Couchman, Richard; Mahan, Guy W.; Bundy, Hugh R.; and Pahl, Robert C., 3,912,151.

Pains-Wessex Limited: *See—*
Murray, Dudley Charles; and Elstow, William Rupert Brooke, 3,911,823.

Painter, Oliver K.: *See—*
MacDonald, James E.; and Painter, Oliver K., 3,912,597.

Pallof, Julius, to Westinghouse Air Brake Company. Velocity comparison circuit for wheel slip control system. 3,912,034, Cl. 180-82.00R.

Palmer, John F., Jr., to Edwin Cooper, Inc. Preparation of alkenyl succinic anhydrides. 3,912,764, Cl. 260-346.800.

Palmer, Leonard; and Tyler, Michael M., to Burroughs Corporation. Multi-memory computer system. 3,913,073, Cl. 340-172.500.

Panasjuk, Vladimir Vasilievich; Makarov, Genrikh Nikolaevich; Teterko, Anatoly Yakovlevich; and Kartovsky, Ivan Vasilievich. Method of inspecting powder-cored electrodes and device for effecting said method. 3,913,009, Cl. 324-34.00R.

Panin, Valentin Ivanovich: *See—*
Selivanov, Mikhail Prokhorovich; Neiman, Vladimir Genrikhovich; Tochilin, Jury Viktorovich; Shamro, Boris Vitalievich; and Panin, Valentin Ivanovich, 3,911,725.

Papillon, Bernard: *See—*
Communal, Jean Pierre; Fritz, Jacques; and Papillon, Bernard, 3,912,607.

Papst-Motoren KG: *See—*
Muller, Rolf, 3,912,956.

Paradee, Sidney A.: *See—*
Bridenbaugh, Peter R.; Kovolick, Albert J.; and Paradee, Sidney A., 3,911,704.

Paridaens, Cornelis Johannes Henricus, to U.S. Philips Corporation. Deflection device for a color television display tube. 3,913,043, Cl. 335-212.000.

Parise, Carl, to Parise & Sons, Inc. Steam cleaner dump bucket. 3,911,524, Cl. 15-353.000.

Parise & Sons, Inc.: *See—*
Parise, Carl, 3,911,524.

Park, John N.: *See—*
Steigerwald, Robert L.; and Park, John N., 3,913,002.

Parker, Charles J.: *See—*
Domicone, Joseph J.; and Parker, Charles J., 3,911,998.

Parker-Hannifin Corporation: *See—*
Lefebvre, Arthur Henry; and Norster, Eric Roy, 3,912,164.

Parkins, Derek Ray, to SKF Industrial Trading and Development Company B.V. Hydraulic clutch and clutch brake operation. 3,912,058, Cl. 192-18.00A.

Parkinson Cowan Appliances Limited: *See—*
Harding, Brian; Aldis, Arthur John; and Collins, Kenneth Edmund, 3,912,161.

Parry, Leslie John: *See—*
Gorman, Leonard Francis; and Parry, Leslie John, 3,912,029.

Passarella, Thomas M. Isolation circuit for arc reduction in a DC circuit. 3,912,941, Cl. 307-136.000.

Patel, Arvind M., to International Business Machines Corporation. Error correction of serial data using a subfield code. 3,913,068, Cl. 340-146.1AL.

Patel, Jitendra A.: *See—*
Kravitz, Stanley; and Patel, Jitendra A., 3,912,621.

Patience, Brian Michael, to International Standard Electric Corporation. Telegraph transmission apparatus. 3,912,863, Cl. 178-17.500.

Paton, Hamilton Neil King; Skilling, John B.; and Smith, Frank F. Vehicle side bearing and friction damper. 3,912,343, Cl. 308-138.000.

Patrick, Earnest H. Combined air conditioner, beverage cooler, and engine efficiency booster. 3,912,475, Cl. 62-7.000.

Patterson, David A.: *See—*
Cline, Carl F.; and Patterson, David A., 3,912,521.

Patterson, Ethredge T. Self-coupling hitch. 3,912,302, Cl. 280-477.000.

Paul, Bruno; Wilisch, Jurgen; and Ihlenburg, Rainer, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken-Teldec. Operating program control for a record playback device. 3,912,279, Cl. 274-10.00R.

Pauletich, Joseph. Steam imploder. 3,912,042, Cl. 181-118.000.

Paulsen, Earl W. Sharpening jig for recutter screen. 3,911,628, Cl. 51-217.00R.

Pava, Norman. Back packing and camping system. 3,912,138, Cl. 224-10.000.

Pawlowski, Jacek: *See—*
Lowe, Walter D.; and Pawlowski, Jacek, 3,911,950.

Payne, Charles C.; Bloemke, Richard E.; and Schaefer, David P., to Nalco Chemical Company. Synthetic bulk fabric treated with organically modified SiO_2 aquasol. 3,912,841, Cl. 428-96.000.

Payne, Guy D., to Outboard Marine Corporation. Snowmobile ski mounting arrangement. 3,912,030, Cl. 180-5.00R.

Pearson Bros. Co., Inc.: *See—*
Quick, Fred L., 3,911,837.

Pearson, Eugene W., to Canron, Inc. Rake angle and related stroke control for a shear or the like. 3,911,775, Cl. 83-626.000.

Pelfrey, Raymond H. Toy field goal kicker. 3,911,616, Cl. 46-128.000.

Pelly AB: *See—*
Nilsson, Alvar Erling, 3,911,826.

Peltier, Jean Paul: *See—*
Lacotte, Jean Pierre; Le Carvennec, Francois; Le Merer, Jean Pierre; Malissin, Roland; and Peltier, Jean Paul, 3,912,922.

Pelton, Peter G., to Continental Can Company, Inc. Pressure release mechanism. 3,912,130, Cl. 222-396.000.

Pelz, David Todd. Golf club. 3,912,277, Cl. 273-186.00A.

Pennsylvania Research Associates, Inc.: *See—*
McInerny, George P., 3,912,255.

Pennwalt Corporation: *See—*
Bafford, Richard Anthony, 3,912,791.

Perry, Achilles, to Interpace Corporation. Method for replacing existing utility pole without disturbing hardware mounted thereon. 3,911,548, Cl. 29-401.000.

Perry, David L.: *See—*
Ritter, Arthur J., Jr.; and Perry, David L., 3,912,336.

Perry, Joseph P.: *See—*
Luce, Robert L.; Perry, Joseph P.; and Sansburry, James D., 3,912,558.

Persson, Holger Alexis, to AB Bahco Ventilation. Latching device for compact filter cells. 3,912,308, Cl. 292-54.000.

Pesek, Miroslav; and Hrabak, Frantisek, to Ustav pro vyzkum, vyrobu a vyuziti radiosotopu. Method of stabilization of lignocellulose materials. 3,912,837, Cl. 427-393.000.

Pessen, David W.: *See—*
Keini, David; and Pessen, David W., 3,912,052.

Peter, John William, to Cincinnati Milacron, Inc. Apparatus for mixing and injecting liquids into a mold. 3,912,234, Cl. 259-4.000.

Peter, Richard; and Angliker, Hans-Joerg, to Ciba-Geigy AG. Disazo dyestuffs of the disperse series wherein two azobenzene molecules are linked together. 3,912,712, Cl. 260-184.000.

Peters, Kenneth, to Electric Power Storage Limited. Electric storage battery grids. 3,912,537, Cl. 136-26.000.

Peters, Norman D., to United States of America, Health, Education, and Welfare. Adjustable microvascular U-clamp. 3,911,926, Cl. 128-325.000.

Peterson, Otis G.: *See—*
Tuccio, Sam A.; and Peterson, Otis G., 3,913,033.

Peterson Tractor Co.: *See—*
Kruschke, Melvin W., 3,912,093.

Petty, Terry; Costello, Carmon R.; Bell, John L.; Childers, Mark A.; and Rao, Gude P., to Ocean Drilling & Exploration Company. Integrated chain-wire rope mooring system. 3,912,228, Cl. 254-175.700.

Peyser, Harry A.; and Herbst, Edward J., to Continental Can Company, Inc. Coined end panel. 3,912,113, Cl. 220-268.000.

Peyton, John F.; Gonzalez, Juan, Jr.; and Trelease, Robert B., to Federal-Mogul Corporation. High temperature duct insulator and method of making same. 3,911,961, Cl. 138-113.000.

Pfabe, Kort K., to ACF Industries, Incorporated. Diaphragm fuel pump with field serviceable gas filter. 3,912,423, Cl. 417-313.000.

Pfau, Jean; Rhyner, Heinz; and Marendaz, Georges-Andre, to Ateliers des Charmilles, S.A. Process for checking and adjusting the operation of an electro-erosion machining apparatus. 3,912,898, Cl. 219-69.00M.

Pfeffer, Philip E.; and Silbert, Leonard S., to United States of America, Agriculture. Process for the preparation of α-alkyl hydracrylic acids and α-alkyl acrylic acids. 3,912,772, Cl. 260-413.000.

Pfeifer, Josef; and Hofmann, Wilfried, to Agfa-Gevaert Aktiengesellschaft. Apparatus for wet treatment of webs of photosensitive material. 3,913,119, Cl. 354-298.000.

Pfeiffer, Heinrich; Beich, Wolfgang; and Zollner, Georg, to Schering Aktiengesellschaft. Novel hydroxy- and alkoxyacetamidotriiodobenzoic acids. 3,912,776, Cl. 260-501.110.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,912,759.

Pfirrmann, Victor: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrmann, Victor, 3,912,196.

Pfizer Inc.: *See—*
Michel, Frank, 3,912,102.
Miller, Max W., 3,912,723.

Pfleiderer, Wolfgang: *See—*
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,912,762.

Pflugner, Wolfgang; and Rabe, Jurgen, to Industriewerk Schaeffler OHG. Die cast bearing housing and bearing thereof. 3,912,347, Cl. 308-236.000.

Phifer, Clarence G., to White-Westinghouse Corporation. Self-cleaning oven latch-lock-control arrangement. 3,912,904, Cl. 219-413.000.

Philco-Ford Corporation (Now Aeronutronic Ford Corporation): *See—*
Christopherson, Rodger L., 3,912,859.

Philip A. Hunt Chemical Corporation: *See—*
Bulloch, David K.; and Klein, Ronald A., 3,912,514.

Philipp, Manfred H. W.; Bender, Myron L.; and Valenzuela, Pablo V., to United States of America, Health, Education, and Welfare. Method of purifying enzymes using boronic acids covalently bonded to an insoluble support. 3,912,595, Cl. 195-66.00R.

Phillip Morris Incorporated: *See—*
Houck, Willie G., Jr.; and Claflin, Warren E., 3,911,932.

Phillips, Edwin R.: *See—*
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Phillips Petroleum Company: *See—*
Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., 3,912,763.
Hughes, James K.; and Erickson, Wayne K., 3,911,539.
Mathis, Ronald D., 3,912,686.
Nowack, Gerhard P.; and Johnson, Marvin M., 3,912,787.
Seefluth, Charles L., 3,912,445.
Short, James N.; Edmonds, Lee O., deceased; and Edmonds, James T., Jr., 3,912,695.
Short, James N., 3,912,703.

Phillips, William J.: *See—*
Williamson, Clyde E.; Acker, Roy M.; Greenbaum, Gilbert A.; and Phillips, William J., 3,913,105.

Physics International Company: *See—*
Creedon, John Michael; and Putnam, Sidney Darwin, 3,912,930.

Pickford, Edward V.; Mahone, Richard M.; and Wolk, Herbert L., to United States of America, Navy. Slam/shock isolation pedestal. 3,912,248, Cl. 267-131.000.

Pierce, Joseph E., to Dart Industries Inc. Container film cutting assembly. 3,911,556, Cl. 29-558.000.

Pierce, Joseph E., to Dart Industries Inc. Container film cutting assembly. 3,911,557, Cl. 29-565.000.

Pierce, Paul W. Beehive opening tool. 3,911,513, Cl. 6-12.00R.

Piesch, Steffen: *See—*
Ribka, Joachim; Piesch, Steffen; and Engelhardt, Friedrich, 3,912,780.

Pigorsh, Walter Michael, to Kitson Poultry Equipment Co. Cage gate latch. 3,912,313, Cl. 292-258.000.

Pilling Co.: *See—*
Fridolph, John W.; Wilson, Robert W.; and Kulp, Rodney J., 3,911,766.

Pilot Pen Company, Ltd., The: *See—*
Miyajima, Tamotsu; Enami, Shigekazu; Murai, Takamaru; and Kobayashi, Katsuhiko, 3,912,520.

Pinheiro, Edwin J.: *See—*
Homberg, John A.; McLaughlin, Albert T.; Melus, John J.; Pinheiro, Edwin J.; Recks, John A.; and Rittenburg, George, 3,913,074.

Pink, John J.: *See—*
Maxwell, Richard D.; Pink, John J.; Fitzharris, Michael J.; and Marz, Louis R., 3,911,692.

Pinkerton, Dale Farnsworth. Single copy newsstand vendor. 3,912,124, Cl. 221-298.000.

Pioneer Products Company: *See—*
De Lancey, Warren H., 3,912,059.

Pippitt, Max Elliot: *See—*
Essex, Frederick William, Jr.; and Pippitt, Max Elliot, 3,912,109.

Pira, Edward S. Method and apparatus for controlled drip irrigation from chamber means located at varying elevations along soil areas to be irrigated. 3,912,165, Cl. 239-11.000.

Piro, Mario, to Nuova San Giorgio S.p.A. Apparatus for the automatic insertion of pins in a cylinder for a hosiery machine. 3,911,695, Cl. 66-1.00R.

Pitcher, Pamela Mary: *See—*
Cayzer, Ian; and Pitcher, Pamela Mary, 3,912,805.

Pitney-Bowes, Inc.: *See—*
Dlugos, Daniel F., 3,913,095.
Lupkas, Raymond R., 3,911,862.

Pitto, Yves-Michel, to Tarex-Manurhin S.A. Fabrique de Machines. Control device of an oscillating element of a machine-tool. 3,911,754, Cl. 74-102.000.

Place, Donald E., to Therm-O-Disc, Incorporated. Thermostat with positive-off mechanism. 3,913,053, Cl. 337-347.000.

Plana, Roberto, to AMP Incorporated. Electric switch. 3,912,895, Cl. 200-164.00A.

Plate, Richard W. R., to Knoll International, Inc. Cushioned furniture. 3,911,512, Cl. 5-352.000.

Platt International Limited: *See—*
Smith, Alan, 3,911,658.

Platt, Stephen A., to Platt, Stephen A.; and Platt, Vernet B. Sound reproduction apparatus. 3,912,281, Cl. 274-16.000.

Platt, Vernet B.: *See—*
Platt, Stephen A., 3,912,281.

Plessey Handel und Investments A.G.: *See—*
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Plessey Incorporated: *See—*
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Plevak, Lubomir: *See—*
Becker, Kunibert; Holken, Norbert; Plevak, Lubomir; and Wojaczek, Egon, 3,911,686.

Plooy, Ronald J.: *See—*
Huemmer, Thomas F.; and Plooy, Ronald J., 3,912,670.

Plough, Inc.: *See—*
Kingsford, Ted I., 3,911,936.

Pofferi, Giancarlo. Demountable structural joint. 3,912,410, Cl. 403-170.000.

Pogainis, Edmunds M.: *See—*
Ely, Robert B.; Pogainis, Edmunds M.; and Hoffman, Clarence A., 3,912,626.

Polaroid Corporation: *See—*
Burke, Edward F., Jr., 3,912,381.
Delahunt, Robert M., 3,912,543.
Mason, Paul B., 3,912,382.

Poletto, John Frank; Allen, George Rodger; Littell, Ruddy; and Weiss, Martin Joseph, to American Cyanamid Company. Substituted nitrogen containing heteroethyleneindoles. 3,912,746, Cl. 260-296.00B.

Pollock, E. Kears; and Umbel, Forrest K., to PPG Industries, Inc. Controlled manufacturing process. 3,912,912, Cl. 235-150.100.

Polster, Johannes: *See—*
Heid, Christian; Hoffmann, Dieter; and Polster, Johannes, 3,912,654.

Poly-Growers, Inc.: *See—*
Bryfogle, Kenneth G.; and Bartlett, Gary F., 3,911,632.

Ponczek, George Mark; and Seitz, Charles F., to Sunbeam Corporation. Can opener. 3,911,571, Cl. 30-4.00R.

Pondell, Stan A., to Butler Manufacturing Company. Power train for a ring-drive silo unloader. 3,912,090, Cl. 214-17.0DB.

Ponjee, Johannes Jacobus; Van Dam, Hendrik Tjapko; and Schoot, Cornelis Johannes, to U.S. Philips Corporation. Image display cell. 3,912,368, Cl. 350-160.00R.

Poole, Charles W., to Westinghouse Electric Corporation. Power circuit including current limiting device for an electric vehicle. 3,912,978, Cl. 317-20.000.

Popek, Stephen: *See—*
Englund, James A.; and Popek, Stephen, 3,911,638.

Popova, Inesa Vladimirovna: *See—*
Kulbakh, Valter Osvaldovich; and Popova, Inesa Vladimirovna, 3,912,714.

Poran, Michael, to Officine Meccaniche Danieli. Rotary sliding gate valve for molten metal. 3,912,134, Cl. 222-504.000.

Pospiech, Manfred: *See—*
Kehry, Manfred; and Pospiech, Manfred, 3,913,066.

Possis Corporation: *See—*
Anderson, Dale L., 3,911,563.

Potter Electric Signal Co.: *See—*
Ward, David M., 3,912,247.

Powers, Kerns H.; and Stetz, Lewis L., Jr., to United States of America, Navy. Noise cancelling magnetic antenna for use with watercraft. 3,913,107, Cl. 343-709.000.

Powter, Edwin John; Benton, Robert Humphrey; and Huth, Eric Abraham, deceased. Acoustic measurement. 3,912,880, Cl. 179-175.10A.

Poznanska Fabryka Lozysk Tocznych: *See—*
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PPG Industries, Inc.: *See—*
Biedermann, Allen J., 3,911,565.
Chang, Wen-Hsuan; and Hartman, Marvis E., 3,912,790.
Pollock, E. Kears; and Umbel, Forrest K., 3,912,912.

Prasher, Charles Lindsay, to Babcock & Wilcox Company, The. Apparatus for the internal inspection of tubular conduits. 3,911,750, Cl. 73-432.00R.

Precision Valve Corporation: *See—*
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Premier Drum Company Limited, The: *See—*
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Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Methods of introducing geometrical variations in optical fibers. 3,912,478, Cl. 65-2.000.

Prevot, Michel: *See—*
Gravisse, Philippe Edouard Leon Alexis; and Prevot, Michel, 3,912,931.

Price Brothers Company: *See—*
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Prickett, Michael J.: *See—*
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Prikhodko, Valery Alexandrovich: *See—*
Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich, 3,912,847.

Princeton Biomedix, Inc.: *See—*
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Pringle, William L., to United States Steel Corporation. Door hinge assembly. 3,911,529, Cl. 16-142.000.

Prochnau, Reinhard: *See—*
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Procter & Gamble Company, The: *See—*
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Prohaska, Peter J. H. Door security system and method of attaching it. 3,911,622, Cl. 49-383.000.

Proriol, Jacques: *See—*
Chomat, Max; and Proriol, Jacques, 3,911,962.

Pruess, David Louis: *See—*
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Pryor, Michael J.; Ford, James A.; and Dean, Sheldon W., to Swiss Aluminium Ltd. Aluminum alloys for long run printing plates. 3,911,819, Cl. 101-459.000.

Pugin, Andre: *See—*
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Pullman Incorporated: *See—*
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Pundyk, Bernard, to Glamorise Foundations, Inc. Brassiere with improved breast cup construction. 3,911,931, Cl. 128-425.000.

Putnam, Sidney Darwin: *See—*
Creedon, John Michael; and Putnam, Sidney Darwin, 3,912,930.

Quaintance, Benjamin W., to International Paper Company. Pallet. 3,911,834, Cl. 108-57.000.

Quaker Oats Company, The: *See*—
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Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,818.
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,819.
Chandler, Keith L.; Hyldon, Roy G.; and O'Mahony, John P., 3,912,821.

Quantz, Norman G.; and Lee, Chen Yi, to Lectron Products, Inc. Method and apparatus for detecting the occupancy of a vehicle seat. 3,912,939, Cl. 307-10.0SB.

Quasar Electronics Corporation: *See*—
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Quebedeaux, Bruno, Jr.: *See*—
Fawzi, Maged M.; and Quebedeaux, Bruno, Jr., 3,912,496.

Quick, Fred L., to Pearson Bros. Co., Inc. Liquid fertilizer injector. 3,911,837, Cl. 111-7.000.

Quinn, Frederic R., to Zyrotron Industries, Inc. Method of fabricating an array of semiconductor elements. 3,911,561, Cl. 29-588.000.

R. A. Lister & Company Limited: *See*—
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R. E. Phelon Company, Inc.: *See*—
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Rachlin, Joel R.; and Neudek, Rudolph O. Method of making and installing a ventillating air distribution channel. 3,911,639, Cl. 52-745.000.

Rachor, Donald G.; and Ludwig, Charles H., to Georgia-Pacific Corporation. Lignin composition and process for its preparation. 3,912,706, Cl. 260-124.00R.

Rachor, Lothar; and Spener, Gerhard, to Hochtemperaturreaktor-Brennelement GmbH. Process for production of fuel bodies, fuel elements and absorber elements for high temperature reactors. 3,912,798, Cl. 264-.500.

Rademachers, Jakob: *See*—
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Raff, Dieter: *See*—
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Raffetto, Michael J.; Otto, Ted; and Opocensky, Willard John, to Xerox Corporation. Head interlacing technique. 3,913,142, Cl. 360-109.000.

Ragsdale Brothers Inc.: *See*—
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Rahemba, Francis J.: *See*—
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Raidel, John E. Vehicle suspension assembly. 3,912,294, Cl. 280-104.50A.

Raitto, Russell G., to Concord Laboratories. Suction catheter. 3,911,919, Cl. 128-276.000.

Ramagopal, G. R., to Tee-Pak, Inc. Printing of regenerated cellulose sausage casing. 3,912,839, Cl. 428-35.000.

Ranallo, Henry U.: *See*—
Wiltshire, Arthur J.; Ranallo, Henry U.; and Czumber, Frank E., 3,911,965.

Randa, Rudolf, to Leybold-Heraeus GmbH & Co. KG. Vacuum electric arc furnace with lock chamber. 3,912,848, Cl. 13-31.000.

Randell, Werner M.: *See*—
Buckholtz, Eric A.; and Randell, Werner M., 3,911,696.

Randerath, Walter, to Mannesmann Aktiengesellschaft. Bending the edges of sheet or plate stock. 3,911,709, Cl. 72-179.000.

Ranheim, John W.: *See*—
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Rank Organisation Limited, The: *See*—
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Rao, Gude P.: *See*—
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Rasmussen, Lyle E., to United States of America, Air Force. Time sharing radiometer system. 3,913,018, Cl. 325-324.000.

Rast, Gustaf J., Jr.: *See*—
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Rauser, Jan Axel Ingemar, to Tetra Pak International AB. Apparatus and method for the cleaning and sterilizing of filler pipes in packing machines. 3,912,535, Cl. 134-22.00C.

Rausing, Hans A., to Tetra Pak Development SA. Method for the packing under aseptic conditions of sterile goods into containers. 3,911,640, Cl. 53-21.0FC.

Ravault, Frank Ernest George; and Edwards, Bryan William, to Foseco International Limited. Radiant gas burners. 3,912,443, Cl. 431-328.000.

Raymond Lee Organization, Inc., The: *See*—
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Maheu, Joseph S., 3,911,601.
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Raynaud, Guy M.: *See*—
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Rayner, Adrien Patrick; Tod, Christopher James Niebuhr; and James, Michael. Childproof closure. 3,912,101, Cl. 215-220.000.

RCA Corporation: *See*—
Bosselaers, Robert Jan, 3,913,028.
Carter, George William; and Hilliker, Stephen Earl, 3,913,038.
Fillmore, Richard Plumb, 3,912,977.
Fillmore, Richard Plumb, 3,913,006.
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Gorog, Istvan; and Firester, Arthur Herbert, 3,912,386.
Hammer, Jacob Meyer, 3,912,363.
Hammond, Robert James; Miller, Carl Wayne; and Culver, Larry Fred, 3,912,283.
Isham, Robert Haynes, 3,912,942.
Miller, Michael Evans, 3,912,857.
Roach, William Ronald, 3,912,370.
Rosen, Arye; and Reynolds, James Francis, 3,913,040.
Thomas, Lucius Ponder, 3,912,849.

Recchia, Frank P.; and Shah, Tilak M., to Upjohn Company, The. Photopolyer composition containing a polyurethane binding agent. 3,912,516, Cl. 96-85.000.

Recherche et Industrie Therapeutiques: *See*—
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Recks, John A.: *See*—
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Redman, Charles M., to United States of America, Army. Integration flash transfer plate. 3,912,371, Cl. 350-161.000.

Redman, Eugene K.: *See*—
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Rees, John Michael; and Goddard, Vivian Walter, to Thorn Electrical Industries Limited. Electric incandescent lamps. 3,912,961, Cl. 313-223.000.

Regents, University of California: *See*—
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Regna, Peter J.: *See*—
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Rehn, Gary Allen, to Deere & Company. Automatic leveling mechanism for disk harrows. 3,912,017, Cl. 172-328.000.

Rehr, Henry W.: *See*—
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Reighard, Alan B.; and Tamny, Simon Z., to Nordson Corporation. Filter cartridge for thermoplastic applicator system. 3,912,630, Cl. 210-130.000.

Reinhold, Herbert E., Jr., to Survival Technology, Inc. Dry applied and operably dry electrode device. 3,911,906, Cl. 128-2.06E.

Reinke, Richard F. Lightweight traveling irrigation system. 3,912,170, Cl. 239-177.000.

Reinmoller, Adolf; and Werner, Paul, to Fritz, Keiper. Seat construction. 3,912,215, Cl. 248-421.000.

Reitz, Werner: *See*—
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Reliable Electric Company: *See*—
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Remington Arms Company, Inc.: *See*—
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Rendell, Stanley E., to Norlin Music, Inc. Electric guitar with slidable pickup beneath strings. 3,911,777, Cl. 84-1.160.

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Rentschler, John S.: *See*—
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Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Machine for processing skins or hides. 3,911,703, Cl. 69-37.000.

Republic Steel Corporation: *See*—
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Requarth, Robert E. Hydraulic ejection device. 3,911,718, Cl. 72-342.000.

Reschke, Erwin A.; and Heron, Robert, to Heron-Poma Company. Ski lift bullwheel. 3,911,765, Cl. 74-801.000.

Research Foundation for Microbial Diseases of Osaka University: *See*—
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Ribka, Joachim; Piesch, Steffen; and Engelhardt, Friedrich, to Cassella Farbwerke Mainkur AG. Substituted methylene diamines. 3,912,780, Cl. 260-561.00N.
Rice, Walton M. Skiing simulator. 3,912,260, Cl. 272-57.00B.
Rich, Ernest J.; Farrell, Joseph S.; and Flam, Eric, to Princeton Biomedix, Inc. Eversible catheter. 3,911,927, Cl. 128-349.00R.
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Rich, Robert S. Collapsible sled. 3,912,290, Cl. 280-9.000.
Richard, George Charles, Jr.; Richard, John Henry; and Molennor, Anthony L. Heating apparatus. 3,911,894, Cl. 126-121.000.
Richard, Gerard Yves. Process and installation for the distribution, into a mold, by high speed projection, of a granular and/or pulverulent mixture. 3,912,238, Cl. 259-151.000.
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Ritter, Arthur J., Jr.; and Perry, David L., to Caterpillar Tractor Company. Protective shroud for the drive sprocket of a track-type vehicle. 3,912,336, Cl. 305-12.000.
Ritter, Joseph J., to United States of America, Commerce. Exponential dilution flask. 3,911,723, Cl. 73-1.00R.
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Roberson, Donald K., to Motorola, Inc. Integrated semiconductor transistor structure with epitaxial contact to the buried sub-collector including fabrication method therefor. 3,913,124, Cl. 357-40.000.
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Robinson, Mark L., to Acro, Inc. Game racket. 3,912,268, Cl. 273-73.00H.
Robinson, Richard C., to United States of America, Navy. Bistable frequency fuze system for VT fuze. 3,913,102, Cl. 343-7.0PF.
Rochon, Robert W.; and Sneed, Joseph W., Jr. Pneumatic fluid weighing device. 3,911,741, Cl. 73-153.000.
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Roginson, Richard. V.T.O.L. engine with vertical thrust control. 3,911,673, Cl. 60-229.000.
Rohm, Fritz; and Strahle, Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Dosing apparatus for mixing the constituents of tooth fillings. 3,911,582, Cl. 32-40.00R.
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Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
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Rorner, Karl: *See—*
Wustinger, Karl Heinz; and Rorner, Karl, 3,911,712.
Rosa, Drahomir: *See—*
Vasicek, Zdenek; Kral, Jan; Stefek, Frantisek; Halfar, Josef; and Rosa, Drahomir, 3,912,220.
Rosen, Arye; and Reynolds, James Francis, to RCA Corporation. Microstrip carrier for high frequency semiconductor devices. 3,913,040, Cl. 333-84.00M.
Rosen, Sidney. Modular type liquid filling machine. 3,911,976, Cl. 141-84.000.
Rosier, Laurence L., to International Business Machines Corporation. Magnetic bubble domain pump shift register. 3,913,079, Cl. 340-174.0TF.
Ross, James A.; and Houdyshel, James A., to Rohr Industries, Inc. Wheeled vehicle magnetic suspension system. 3,911,829, Cl. 105-157.00R.
Rossel, Claude, to Biviator S.A. Installation for monitoring several persons or objects. 3,911,905, Cl. 128-2.06R.
Roth, Shirley H., to Cities Service Oil Company. Article comprising a substrate coated with an aminobenzenesulfonamide-aldehyde interpolymer intumescent composition. 3,912,845, Cl. 428-524.000.
Roth, Willy: *See—*
Varsanyi, Denis; and Roth, Willy, 3,912,518.
Rothkamp, Josef: *See—*
Thummler, Ursus; and Rothkamp, Josef, 3,912,245.
Rousseau, Joseph. Device for cutting down tree stems. 3,911,979, Cl. 144-2.00N.
Rowe, Adrian Harold Redfern: *See—*
Forrest, John Orchover; and Rowe, Adrian Harold Redfern, 3,911,587.
Roy, Marie-Annick, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Digital group modulator. 3,912,870, Cl. 179-15.0FS.
Royer, William Anthony; Testardi, Louis Richard; and Wernick, Jack Harry, to Bell Telephone Laboratories, Incorporated. Film material and devices using same. 3,912,611, Cl. 204-192.000.
RTE Corporation: *See—*
Mikulecky, Harvey W., 3,913,050.

Rubinfeld, Joseph: *See—*
Schrager, Jerome Stanley; Rubinfeld, Joseph; and Trombone, Thomas Joseph, 3,912,777.

Rubinstein, Herbert J., to United States of America, Energy Research and Development Administration. LMFBR with booster pump in pumping loop. 3,912,584, Cl. 176-40.000.

Rundin, Sten E.; and Westlund, Jan H., to Auto Tank AB. Self service system. 3,913,069, Cl. 340-147.00A.

Rush, James B.; and Logan, Arthur D., to Dayco Corporation. Permanently coded polymeric compound and method of coding and identifying same. 3,912,928, Cl. 250-302.000.

Rutgerswerke Aktiengesellschaft: *See—*
Finger, Carl; Franck, Heinz-Gerhard; Turowski nee Hinz, Else Paula Maria, heir; Turowski, Johannes, deceased; and Zander, Maximilian, 3,912,781.

Ruti Machinery Works Ltd.: *See—*
Zollinger, Hans, 3,911,968.

Rydborn, Sten Ake Olaus. Stop motion device for weft in the form of a single thread or several threads. 3,911,969, Cl. 139-370.000.

Ryding, Thomas C., to General Motors Corporation. Fuel tank extendable filler neck assembly. 3,912,117, Cl. 220-293.000.

Saba, Joseph M., to Technical Resources, Inc. Blood pressure manometer. 3,911,904, Cl. 128-2.05G.

Sabatino, Anthony, to Gould, Inc. Methods for mounting battery plates. 3,912,544, Cl. 136-134.00R.

Saimyo, Sinzi: *See—*
Fukura, Hiroshi; and Saimyo, Sinzi, 3,912,414.

Saito, Chiaki: *See—*
Horiie, Shigeki; Asai, Shin-ichiro; Moriya, Yoshihisa; and Saito, Chiaki, 3,912,793.

Saito, Nobuyuki: *See—*
Kumon, Osamu; and Saito, Nobuyuki, 3,912,952.

Saito, Takashi: *See—*
Nakadaira, Isamu; and Saito, Takashi, 3,912,280.

Saizon, Floyd S.: *See—*
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Sakakura, Sakae: *See—*
Hoshi, Hiroshi; Sakakura, Sakae; Yoshida, Minoru; Monden, Yoshinobu; Ito, Fumio; and Fujita, Kaoru, 3,912,675.

Sakamoto, Motoyoshi: *See—*
Harigaya, Hiroshi; Sakamoto, Motoyoshi; and Kanai, Masao, 3,912,559.

Sakata Shokai Ltd.: *See—*
Hoshi, Hiroshi; Sakakura, Sakae; Yoshida, Minoru; Monden, Yoshinobu; Ito, Fumio; and Fujita, Kaoru, 3,912,675.

Salem Tool Company, The: *See—*
Deeter, Ronald C.; and Lora, Thad A., 3,912,025.

Salloga, Fred W.: *See—*
Fenster, Abraham S.; and Salloga, Fred W., 3,912,221.

Salway, Peter Hugh; and Todd, Andrew Stephen, to Lucas Electrical Company, The. Vehicle warning systems. 3,913,064, Cl. 340-52.00F.

Sandberg, Robert J.: *See—*
Bollinger, John G.; and Sandberg, Robert J., 3,913,084.

Sanders Associates, Inc.: *See—*
Hayner, Paul F., 3,912,222.

Sandford, W. Nelson: *See—*
Carvell, Bernard J.; Sandford, W. Nelson; and Zimmerman, C. Michael, 3,912,311.

Sandoz Inc.: *See—*
Hardtmann, Goetz E., 3,912,731.

Sanford, Steve Douglas; Chenoweth, Vaughn Charles; and Faulkner, Duane Harold, to Johns-Manville Corporation. Electric furnace outlet. 3,912,488, Cl. 65-326.000.

Sangaree, Dan E.: *See—*
Smith, Roy V., Jr., 3,911,907.

Sangster, Frederik L. J.: *See—*
Mulder, Cornelis; and Sangster, Frederik L. J., 3,912,944.

Sankyo Company Limited: *See—*
Arai, Mamoru; Torikata, Akio; Fukatsu, Hisayoshi; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,912,811.

Sano, Kazuhiko; Nakagawa, Tokiharu; and Omiya, Shoji, to Matsushita Electric Industrial Co., Ltd. Recording and reproducing apparatus using flexible recording media. 3,912,282, Cl. 274-39.00R.

Sano, Kazuo: *See—*
Miyashita, Tsuneo; Nayuki, Toshio; Sano, Kazuo; Yamada, Takeo; Ohzeki, Shoichiro; and Nishio, Hiroaki, 3,912,502.

Sansburry, James D.: *See—*
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Sansing, James Earl: *See—*
Moore, William Percy; and Sansing, James Earl, 3,912,491.

Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., to American Home Products Corporation. 1-Substituted -6-(2-hydroxy-3-substituted aminopropoxy)xanthen-9-ones. 3,912,733, Cl. 260-247.50H.

Santroch, George: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 3,912,729.

Sapino, Chester, Jr.; Vulcano, Albert Louis; Brundidge, Steven Peter; and Mahan, James David, to Bristol-Myers Company. Production of semisynthetic penicillins. 3,912,719, Cl. 260-239.100.

Sapsowitz, Melvin L., to Topps Chewing Gum, Incorporated. Gum product and method of making the same. 3,912,817, Cl. 426-5.000.

Sargent, Raymond W., to Simmonds Precision Products, Inc. Variable capacitors. 3,912,987, Cl. 317-249.00R.

Sargunar, John E., to Burroughs Corporation. Motor drive including starting and running speed control particularly for magnetic tape transport systems. 3,913,134, Cl. 360-73.000.

Sasabe, Kaoru; and Hayami, Heijiro, to Matsushita Electric Industrial Co., Ltd. Image display system. 3,912,860, Cl. 178-6.800.

Sasaki, Kantaro: *See—*
Sugazawa, Kiyoshi; Ushijima, Kiyoto; and Sasaki, Kantaro, 3,911,997.

Sasaki, Kiyoshi: *See—*
Mikawa, Hiroji; Kato, Yomei; and Sasaki, Kiyoshi, 3,912,476.

Sasaki, Takashi: *See—*
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Sasaki, Takeshi: *See—*
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Sasaya, Minoru: *See—*
Ueno, Hiroshi; Kawasaki, Fumio; Sasaya, Minoru; and Okubo, Kazuo, 3,912,568.

Sasayama, Shinya, to Nippon Kogaku K.K. Photoelectric detector device. 3,912,372, Cl. 356-170.000.

Sassa, Dennis Joseph: *See—*
Rigazio, Livio Angelo; and Sassa, Dennis Joseph, 3,912,881.

Sato, Hisanao: *See—*
Ikeda, Mitsusuke; Sato, Hisanao; Torii, Etsuko; Morimoto, Kazuhisa; and Hasegawa, Yo, 3,912,508.

Sato, Katsuaki: *See—*
Enei, Hitoshi; Anzai, Yasuo; Sato, Katsuaki; Eguchi, Hajime; and Hirose, Yoshio, 3,912,587.

Sato, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Radar detection apparatus for preventing vehicular collisions. 3,913,106, Cl. 343-9.000.

Sauerteig, Wolfgang: *See—*
Monbaliu, Marcel Jacob; Benoy, Gaston Jacob; Van Poucke, Raphael Karel; Sauerteig, Wolfgang; Stieler, Dieter; and De Cat, Arthur Henri, 3,912,513.

Sauter, Richard S.: *See—*
Gerner, Daniel F.; and Sauter, Richard S., 3,912,082.

Sawai, Kisuke: *See—*
Sugaya, Hiroshi; Ishihara, Takeshi; and Sawai, Kisuke, 3,912,483.

Sawchuk, Peter, to Corning Glass Works. Hermetic device enclosure. 3,912,985, Cl. 317-230.000.

Scandia Packaging Machinery Company: *See—*
Anderson, Andrew W.; Leszczynski, Martin E.; and Mateyka, Milan, 3,912,191.

Scarnato, Thomas J.; Cicci, George B.; and Meyer, Martin H., to International Harvester Company. Windrow placement device and harvesting method. 3,911,649, Cl. 56-1.000.

Scarpino, Leopoldo, to AMAX Inc. Means and method for measuring electrical-ground resistance between earth-separated locations. 3,913,010, Cl. 324-51.000.

SCELT Centro Studi e Laboratori Telecomunicazioni: *See—*
De Vincentiis, Girolamo; Dogliotti, Renato; and Luvison, Angelo, 3,913,093.

Schaefer, David P.: *See—*
Payne, Charles C.; Bloemke, Richard E.; and Schaefer, David P., 3,912,841.

Schaeffer, Nerle J., to National Geographic Society. Removable stamp holder for stamping machine. 3,911,813, Cl. 101-43.000.

Schaub Engineering Company: *See—*
Baird, James D., 3,912,954.

Schedler, Walter J. Sound simulator for model steam engine. 3,913,097, Cl. 340-384.00E.

Scheetz, Frank L.; Buck, Francis E.; and Shepard, William B., to United States of America, Navy. Ordnance alignment and loading apparatus. 3,911,786, Cl. 89-1.50R.

Scheffler, Holger: *See—*
Cotte, Dietrich; Scheffler, Holger; and Kertzscher, Claus, 3,911,697.

Scheinberg, Stanley: *See—*
Neumann, Edward W.; Rahemba, Francis J.; and Scheinberg, Stanley, 3,912,668.

Schenley Industries, Inc.: *See—*
Whyte, Andrian Alan, 3,911,798.

Schering Aktiengesellschaft: *See—*
Pfeiffer, Heinrich; Beich, Wolfgang; and Zollner, Georg, 3,912,776.

Schill, John M., to Watertown Table Slide Corporation. Equalizer slide assembly. 3,911,835, Cl. 108-87.000.

Schiller, Paul; Haberland, Ulrich; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Flameproof polycarbonates. 3,912,688, Cl. 260-49.000.

Schindelhauer, Gerhard, to Borsig GmbH; and Wankel GmbH. Lubricating system for rotary piston compressor. 3,912,044, Cl. 184-6.160.

Schirm, Albert C.; and Kunderman, Fred K., to Dresser Industries, Inc. Turbo-machines. 3,912,342, Cl. 308-36.300.

Schiweck, Hubert, to Suddeutsche Zucker-Aktiengesellschaft. Renal clearance method employing isomaltitol. 3,912,804, Cl. 424-9.000.

Schleifenbaum, Karl, to Meteor-Siegen Apparatebau Paul Schmeck GmbH, Firma. Transport and shearing apparatus. 3,911,771, Cl. 83-81.000.

Schleifstein, Harvey G.: *See—*
Haeberle, Robert W.; Lennon, Donald J. J.; and Schleifstein, Harvey G., 3,913,110.

Schlumberger Technology Corporation: *See—*
Nicolas, Yves; and Landaud, Andre, 3,911,743.
Nutter, Benjamin P., 3,912,006.

Schmelzle, Wolfgang: *See—*
Mermi, Kurt; Schmelzle, Wolfgang; Bappert, Adolf; and Tutsch, Werner, 3,912,213.

Schmermund, Alfred. Folding device for packaging material. 3,911,645, Cl. 53-234.000.

Schmermund, Alfred. Curve milling or curve grinding machines including feed rate control. 3,912,995, Cl. 318-571.000.

Schmidiger, Fritz. Baseboard to receive electrical lines. 3,911,637, Cl. 52-287.000.

Schmidt, Oswald, to BASF Aktiengesellschaft. Dyeing natural polyamide fibers. 3,912,447, Cl. 8-19.000.

Schneeberger, Fritz: *See—*
Zweifel, Walter; and Schneeberger, Fritz, 3,912,602.

Schneider, Robert A.; and Kroon, Willem L., to Spin Physics, Inc. Magnetic head face assembly using chemically machinable glass ceramic bonding means. 3,913,143, Cl. 360-127.000.

Schober, Horst A.: *See—*
Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., 3,912,120.

Schoffmann, Rudolf. Flame cutting machine. 3,912,242, Cl. 266-23.00K.

Scholten-Honig Research B.V.: *See—*
Boonstra, Douwe Johannes; and Bakker, Age, 3,912,713.

Schoot, Cornelis Johannes: *See—*
Ponjee, Johannes Jacobus; Van Dam, Hendrik Tjapko; and Schoot, Cornelis Johannes, 3,912,368.

Schrade, Jean. Heat exchanger. 3,912,003, Cl. 165-165.000.

Schrager, Jerome Stanley; Rubinfeld, Joseph; and Trombone, Thomas Joseph, to Colgate-Palmolive Company. Use of sulfuric acid as an extractant in olefin sulfonation. 3,912,777, Cl. 260-504.000.

Schreiber, Alvin J. Row crop harvesting device. 3,911,651, Cl. 56-98.000.

Schrock, Martin Omer; and Wilhelmi, Albert Andreas, to Black and Decker Manufacturing Company, The. Method of forming head member having integral valve seats for reed valve. 3,911,546, Cl. 29-157.10R.

Schubert, Klaus-Lothar: *See—*
Bolte, Hans-Eckhard; and Schubert, Klaus-Lothar, 3,912,550.

Schuh, Eduard: *See—*
Kelch, Heinz; and Schuh, Eduard, 3,913,136.

Schultz, Jay Ward; and Merrick, Howard Francis, to International Nickel Company, Inc., The. Oxidation resistant dispersion strengthened alloy. 3,912,552, Cl. 148-31.000.

Schulz, Harry, to Maschinenfabrik Augsburg-Nurnberg A.G. Method of and device for separating solid components from a hot combustible gas generated in a reactor. 3,912,464, Cl. 48-95.000.

Schumacher, William J.; and Tanczyn, Harry, to Armco Steel Corporation. Galling resistant austenitic stainless steel. 3,912,503, Cl. 75-125.000.

Schwartz, James W., to Zenith Radio Corporation. Sheet glass color tube face panel with pleated skirt. 3,912,104, Cl. 220-2.10A.

Schwartz, Robert J., to Kimberly-Clark Corporation. Stabilized nonwoven web and method of preparation. 3,912,567, Cl. 156-167.000.

Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut KG. Price-indicating scale. 3,912,027, Cl. 177-40.000.

Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut KG. Price-indicating weighing machine. 3,912,028, Cl. 177-44.000.

Schwarzler, Peter, to Krauss-Maffei Aktiengesellschaft. Linear-induction motor, e.g. for high-speed magnetic-levitation vehicle. 3,911,828, Cl. 104-148.0LM.

Schwarzmann, Matthias: *See—*
Broecker, Franz Josef; Zirker, Guenter; Triebskorn, Bruno; Marosi, Laszlo; Schwarzmann, Matthias; Dethlefsen, Winfried; and Kaempfer, Knut, 3,912,775.

Schweisfurth, Werner, to Meteor-Siegen. Apparatus for attaching self-adhesive perforated edging strips to unperforated sheet material, more particularly drawing copy masters. 3,912,570, Cl. 156-351.000.

Schwelberger, Hubert: *See—*
Sigott, Siegfried; Zitz, Alfred; Schwelberger, Hubert; and Dotsch, Arnold, 3,911,877.

Schwerin, Gunter; and Reitz, Werner, to Robert Bosch G.m.b.H. Hydraulic braking arrangement for towing vehicle with trailer. 3,912,334, Cl. 303-7.000.

Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,912,759.

Schwinn Bicycle Company: *See—*
Von Heitlinger, Eugene, 3,912,333.

Scommegna, Antonio, to Michael Reese Hospital and Medical Center. Anti-fertility device. 3,911,911, Cl. 128-130.000.

Scotese, Anthony C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,912,733.

Scott, Floyd L., Jr.: *See—*
Litchfield, Mason R.; and Scott, Floyd L., Jr., 3,911,590.

Scott, Jay R.: *See—*
Koss, George S.; and Scott, Jay R., 3,911,711.

Scott, John W.: *See—*
Kozlowski, Robert H.; Sieg, Robert P.; and Scott, John W., 3,912,463.

Scovill Manufacturing Company: *See—*
Wallin, Gus, 3,911,935.

Sears, Harold A., to Walker, Hall, Sears, Inc. Geophone with plastic coilform. 3,913,063, Cl. 340-17.000.

Sears, Lawrence Mark. Flip flop controlled annuciator system. 3,913,088, Cl. 340-286.000.

Sedivy, Stanley J., to Zenith Radio Corporation. Color CRT having shadow mask with forwardly directed, outwardly flared skirt. 3,912,963, Cl. 313-402.000.

Seebinger, Frederick L., to American Trading and Production Corporation. Loudspeaker arrangement. 3,912,865, Cl. 179-1.00E.

Seefluth, Charles L., to Phillips Petroleum Company. Mechanism for inserting heater in parison which moves in arcuate path. 3,912,445, Cl. 432-123.000.

Seibel, Charles M., to Textron, Inc. Safe aircraft ammunition container. 3,911,787, Cl. 89-34.000.

Seibel, Charles M.; and Canavespe, Joseph A., to Textron, Inc. Apparatus for extending and retracting a drive shaft. 3,912,199, Cl. 244-17.110.

Seifter, Eli; and Rettura, Giuseppe, to Albert Einstein College of Medicine. Dialytic introduction of maltose into bloodstream. 3,911,915, Cl. 128-214.00R.

Seigler, Jack D.; and Rodgers, Gerald L., to Friedrich Refrigerators Inc. Hazardous duty room air conditioner. 3,911,693, Cl. 62-151.000.

Seitz, Charles F.: *See—*
Ponczek, George Mark; and Seitz, Charles F., 3,911,571.

Selchow, Donald H., Jr., to International Paper Company. Three dimensional shrink film display package. 3,912,079, Cl. 206-463.000.

Selivanov, Mikhail Prokhorovich; Neiman, Vladimir Genrikhovich; Tochilin, Jury Viktorovich; Shamro, Boris Vitalievich; and Panin, Valentin Ivanovich. Method of operating life testing hydraulic units with linear-motion output member. 3,911,725, Cl. 73-15.400.

Sellari, Alfred J.: *See—*
Anlas, Carl J.; and Sellari, Alfred J., 3,911,519.

Sellstedt, John H., to American Home Products Corporation. Intermediates for producing semi-synthetic penicillins. 3,912,750, Cl. 260-306.70E.

Sellstedt, John H.: *See—*
Teller, Daniel M.; and Sellstedt, John H., 3,912,718.

Seltzer, Murray Harold, to Lawrence Peska Associates, Inc., a part interest. Self-lubricating surgical glove. 3,911,501, Cl. 2-167.000.

Semerchian, Aik Akopovich: *See—*
Vereschagin, Leonid Fedorovich; Semerchian, Aik Akopovich; Modenov, Vitaly Pavlovich; Bocharova, Tamara Timofeevna; and Dmitriev, Mikhail Eremeevich, 3,912,500.

Seragnoli, Enzo, to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Device for coordinating and feeding separately objects, particularly sweets and similar, to a wrapping machine. 3,912,123, Cl. 221-237.000.

Sexton, James R.: *See—*
Garbee, Allen K.; Honaker, John A.; and Sexton, James R., 3,912,015.

Seyfried, Klaus: *See—*
Lucking, Hans Joachim; Seyfried, Klaus; Noll, Walter; and Fries, Ludwig, 3,912,604.

Seymour, Raymond Kelsey, to General Electric Company. Raintight enclosure for electrical equipment. 3,912,348, Cl. 312-100.000.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Graziadei, Rinaldo, 3,912,946.

Shafer, Homer J.; and Gerber, David P., to Shafer Valve Company. Safety shut-off for pump. 3,911,678, Cl. 60-400.000.

Shafer Valve Company: *See—*
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Shah, Tilak M.: *See—*
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Shamro, Boris Vitalievich: *See—*
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Sharanov, Mikhail Alexeevich; Silukov, Gennady Alexeevich; Khainovsky, Valentin Petrovich; Olginsky, Felix Yanovich; Solovykh, Vladimir Alexeevich; and Sukhorukov, Alexandr Efimovich. Apparatus for producing granulated slag. 3,912,487, Cl. 65-141.000.

Sharma, Vijay Ratna: *See—*
Ashton, Stanley; Jones, Gwilym Thomas; Sharma, Vijay Ratna; and Taylor, John Anthony, 3,912,749.

Shavel, John, Jr.: *See—*
Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., 3,912,720.

Shaw, Bernard L.: *See—*
Chun, Joong Hee; and Shaw, Bernard L., 3,912,047.

Shay, George C., to Corning Glass Works. Method of glass delivery for press-forming. 3,912,484, Cl. 65-70.000.

Sheafor, John A.: *See—*
Hoover, D. Eugene; Morris, Kenneth T.; and Sheafor, John A., 3,911,990.

Shell Oil Company: *See—*
van Soestbergen, Hans; and van Toor, Pieter, 3,911,975.

Shen, Chung Yu, to Monsanto Company. Tetrasodium and tetrapotassium salts of tetrahydrofuran-2,2,5,5-tetracarboxylic acid. 3,912,765, Cl. 260-347.300.

Shen, Tsung-Ying; and Jensen, Norman P., to Merck & Co., Inc. N-(4-sulfanilylphenyl) phosphoric acid triamides. 3,912,769, Cl. 260-397.600.

Shepard, William B.: *See—*
Scheetz, Frank L.; Buck, Francis E.; and Shepard, William B., 3,911,786.
Shepherd, Glen C.: *See—*
Allen, James B.; Shepherd, Glen C.; and Crawford, Joe W., 3,912,886.
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Sherin, Laima Avgustovna: *See—*
Giller, Solomon Aronovich; Zhuk, Regina Abramovna; Berzin, Anna Eduardovna; Sherin, Laima Avgustovna; and Lazdinsh, Arvid Avgustovich, 3,912,734.
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Shimada, Kazuo; Kotera, Kenichi; Uemura, Takaaki; Imamura, Kunio; Ishikawa, Nobuyoshi; Hojho, Fumiko; and Ugawa, Kiyoshi, to Research Foundation for Microbial Diseases of Osaka University. Method of producing dextranase. 3,912,594, Cl. 195-65.000.
Shimada, Yasuo; and Kowada, Giichiro. Compressing roll in rotary power compression molding machine. 3,912,441, Cl. 425-348.000.
Shimizu, Kiyoshi; and Harada, Susumu, to Nitto Boseki Co., Ltd. Process for producing polyamines. 3,912,693, Cl. 260-78.5BB.
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Shimotani, Eizo; and Sumiyoshi, Tadashi, to Yoshida Kogyo Kabushiki Kaisha. Slide fasteners having a separable end connection. 3,911,536, Cl. 24-205.11F.
Shin-Nippon Seitetsu Kabushiki Kaisha: *See—*
Ono, Yoshio; Kosugi, Minoru; Kan, Okihiko; and Ohde, Mitsuru, 3,912,444.
Shindo, Takemasa: *See—*
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Shinshu Seiki Kabushiki Kaisha: *See—*
Aizawa, Susumu; Futagawa, Yoshikiyo; and Shindo, Takemasa, 3,913,091.
Shiono, Tsuyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Valve assembly of valved wind musical instrument. 3,911,784, Cl. 84-392.000.
Shionogi & Co., Ltd.: *See—*
Mukawa, Fumikazu, 3,912,722.
Ogawa, Yasunao; Yonetani, Yukio; Maekawa, Hideyuki; and Ishitobi, Kaoru, 3,912,457.
Shiosaka, Makoto: *See—*
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Shirley, Albert J. W., to M. L. Aviation Company Limited. Restraining device. 3,912,192, Cl. 242-107.400.
Shirota, Kensho: *See—*
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Shoen, Ramon; and Long, Larry K., to Amerco, Inc. Rotating instrument package. 3,911,900, Cl. 128-2.00D.
Shogren, David K., to Xerox Corporation. Short focal length optical scanning system. 3,912,392, Cl. 355-66.000.
Shooter, Donald H.; and Colbert, Otto F. Wheel balance machine. 3,911,751, Cl. 73-464.000.
Short, James N.; Edmonds, Lee O., deceased (by Edmonds, Emmilou, executrix); and Edmonds, James T., Jr., to Phillips Petroleum Company. Fibrous articles from phenylene sulfide polymers. 3,912,695, Cl. 260-79.000.
Short, James N., to Phillips Petroleum Company. Modification of polymers by treatment with olefins. 3,912,703, Cl. 260-94.70R.
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Fox, Ronald E., 3,912,866.
Shukla, Ravindra Shivprasad; and Zitka, Mary Ann, to American Cyanamid Company. Reagent impregnated paper strips for use in preparing TLC spray reagents. 3,912,655, Cl. 252-408.000.
Shupe, Russell D.: *See—*
Maddox, Jim, Jr.; Tate, Jack F.; and Shupe, Russell D., 3,912,011.
Shurts, Edward Lytle, to Du Pont de Nemours, E. I., and Company. Ethylene/α-olefin copolymerization process. 3,912,698, Cl. 260-80.780.
Si Handling Systems, Inc.: *See—*
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Siddall, John B.: *See—*
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Felkel, Heinrich, 3,913,003.
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Kuhnlein, Hans; Kogler, Georg; and Lanzendorfer, Rudolf, 3,912,990.
Oestreich, Ulrich, 3,912,241.
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Silbert, Leonard S.: *See—*
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Silukov, Gennady Alexeevich: *See—*
Sharanov, Mikhail Alexeevich; Silukov, Gennady Alexeevich; Khainovsky, Valentin Petrovich; Olginsky, Felix Yanovich; Solovykh, Vladimir Alexeevich; and Sukhorukov, Alexandr Efimovich, 3,912,487.
Simmonds Precision Products, Inc.: *See—*
Sargent, Raymond W., 3,912,987.
Simon, Alan J., to Westinghouse Electric Corporation. Thin-film electrical circuit lead connection arrangement. 3,912,852, Cl. 174-68.500.
Simon, Donald R. Automatically operated water distribution systems such as lawn and garden sprinkling systems and timer operated valve therefor. 3,912,167, Cl. 239-66.000.
Simone, Dominic, to NL Industries, Inc. Urea-formaldehyde coated clay particles, as an opacifying agent. 3,912,532, Cl. 106-308.00N.
Simpson, John R. Electric dynamo. 3,912,955, Cl. 310-42.000.
Sinclair, Carter: *See—*
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Sioli, Giancarlo: *See—*
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Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., to Warner-Lambert Company. β- Ketoacyl derivatives of 6-aminopenicillanic acid and process thereof. 3,912,720, Cl. 260-239.100.
Sisco, William C., to Bendix Corporation, The. Control means for a two-stage servomotor. 3,911,681, Cl. 60-553.000.
Sivyer, Robert B. Thermal weld monitoring device. 3,911,747, Cl. 73-343.00R.
Sjostrom, Kathleen Alice: *See—*
Sjostrom, Robert L., 3,911,604.
Sjostrom, Robert L., to Sjostrom, Kathleen Alice. Fabric spreading and feeding machine. 3,911,604, Cl. 38-143.000.
Skaperda, Nikola J., to North Electric Company. Multiple fault tolerant digital switching system for an automatic telephone system. 3,912,873, Cl. 179-18.0FC.
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Skilling, John B.: *See—*
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Skinner, Donald K.: *See—*
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Sladek, Norbert Joseph: *See—*
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Slaven, Thomas L.; and Mollere, John C., to Hercules Incorporated. Water-operated cartridge launcher. 3,912,041, Cl. 181-110.000.
Sletten, Andreas M.; and Cookson, Alan H., to Westinghouse Electric Corporation. Adherent coating for captivating small particles in gas-insulated electrical equipment. 3,911,937, Cl. 134-1.000.
Slide-O-Sell (Proprietary) Limited: *See—*
de Bruyn, Henri Arnold, 3,912,086.
Slott, Steen; and Madsen, Gerda Bente, to Novo Industri A/S. Procedure for liquefying starch. 3,912,590, Cl. 195-31.00R.
Small, Marvin: *See—*
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Smith, Alan, to Platt International Limited. Method of and apparatus for the piecing up of yarns. 3,911,658, Cl. 57-34.00R.
Smith, Alan; and Goulden, Stephen Arthur, to Glaxo Laboratories Limited. Preparation of cephalosporin compounds. 3,912,589, Cl. 195-29.000.

Smith, Baynard R., to Electro Oxide Corporation. Electrical connector and method of making. 3,911,570, Cl. 29-630.00D.
Smith, Chester A., Jr.: *See—*
Gee, William; Smith, Chester A., Jr.; and Hinsen, Clarence E., 3,911,903.
Smith, Colin Howard Stanwell: *See—*
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Smith, David W.: *See—*
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Smith, Frank F.: *See—*
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Smith, Howard C., to Sun Oil Company of Pennsylvania. Portable power impact wrench. 3,912,022, Cl. 173-93.700.
Smith International, Inc.: *See—*
Tschirky, John E.; and Crase, Gary Monroe, 3,912,425.
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Smith, Parker: *See—*
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Smith, Roger A.: *See—*
Dyer, John D.; and Smith, Roger A., 3,911,945.
Smith, Roger Dallas; and Maar, Herbert Karl, to Cincinnati Milacron, Inc. Method and apparatus for extruding plastic pipe and the like. 3,912,240, Cl. 259-185.000.
Smith, Roy V., Jr., to Sangaree, Dan E., a part interest. Planetary exercising machine. 3,911,907, Cl. 128-24.00R.
Smithson, Harold R.; and Stirton, Jerry Allen, to Oxy-Catalyst, Incorporated. Method and apparatus for exchanging catalyst in a catalytic converter. 3,911,971, Cl. 141-1.000.
Smutny, Kurt: *See—*
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Sneed, Joseph W., Jr.: *See—*
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Snyder, Carl J.; Maxwell, Albert H., Jr.; and Doby, William P., to Westinghouse Electric Corporation. Outage indicating apparatus for meter telemetry systems including data recorders. 3,913,129, Cl. 360-6.000.
Snyder, Louis J., to Ethyl Corporation. Determination of antiknock compounds in gasoline. 3,912,454, Cl. 23-230.00R.
S.p.A. Luigi Rizzi & C.: *See—*
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Societe Anonyme dite L'Oreal: *See—*
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Societe Anonyme Moulinex: *See—*
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Societe d'Etudes de Machines Thermiques: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Soderhamn Machine Manufacturing Company: *See—*
Gaitten, W. Maynard, 3,911,790.
Sodickson, Lester A.; and Mickiewicz, Stanley P., to Damon Corporation. Method and apparatus for photometric analysis of liquid samples. 3,912,452, Cl. 23-230.00R.
Soehring, Gerhard: *See—*
Kreutze, Gerhard; Moessner, Manfred; Obstfelder, Guenther; Soehring, Gerhard; and Pfirrmann, Victor, 3,912,196.
Sokol, Phillip E., to Gillette Company, The. Hair waving and straightening process and composition containing water-soluble amino and quaternary ammonium polymers. 3,912,808, Cl. 424-71.000.
Sokolovsky, Stanislav Vladimirovich: *See—*
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Sharanov, Mikhail Alexeevich; Silukov, Gennady Alexeevich; Khainovsky, Valentin Petrovich; Olginsky, Felix Yanovich; Solovykh, Vladimir Alexeevich; and Sukhorukov, Alexandr Efimovich, 3,912,487.
Sompayrac, Hewitt A. Locking device. 3,912,314, Cl. 292-285.000.
Sonoda, Yoshiteru, to Fuji Kinzoku Kosaku Kabushiki Kaisha. Automatic drain trap. 3,912,629, Cl. 210-114.000.
Sons, James E.; and Starnes, Wayne C., to Detprotector, Inc. Multilevel current sensing detector system for overcurrent protection of multispeed AC motors. 3,912,976, Cl. 317-13.00R.
Sony Corporation: *See—*
Ishikawa, Yoji, 3,912,182.
Nakagawa, Yutaka, 3,912,945.
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Sorensen, Paul A.: *See—*
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Sorenson, Larry D.; and Goodson, Melvin G. Apparatus for destroying Sapyga wasps. 3,911,612, Cl. 43-132.00R.
Sorice, Edward L., to Kennametal Inc. Cutting insert and holder. 3,911,543, Cl. 29-96.000.
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Sosjurko, Vladimir Georgievich: *See—*
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Valiulis, Stanley J., 3,912,084.
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Spaeth, Irvin J., to Evans Products Company. Railway brake beam head. 3,912,053, Cl. 188-236.000.
Spangler, Ayers M.; and Vagnoni, Luigi A., to United States of America, Navy. Time and condition data logger. 3,911,746, Cl. 73-343.500.
Speedcranes Limited: *See—*
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Spener, Gerhard: *See—*
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Darnall, David L.; Butler, Gene R.; Butler, Lee D.; and Barton, Lester C., 3,911,654.
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Stankiewicz, Raymond J.; and Phillips, Edwin R., 3,913,138.
Spicer, Arnold; and Solomons, Gerald L., to Ranks Hovis McDougall Limited. Edible fungal protein from non-toxic penicillium. 3,912,825, Cl. 426-656.000.
Spiel, Albert, to Hoffman, Harold A. High-protein quick cooking meatlike food made from plant protein materials. 3,912,824, Cl. 426-630.000.
Spin Physics, Inc.: *See—*
Schneider, Robert A.; and Kroon, Willem L., 3,913,143.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C. Emulsified propellant compositions for foamed structures such as applicator pads, and process. 3,912,665, Cl. 260-2.50E.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorethea C. Emulsified propellant compositions for foamed structures such as applicator pads, and process. 3,912,666, Cl. 260-2.50E.
Spitzer, Joseph George; Small, Marvin; Osipow, Lloyd I.; and Marra, Dorothea C. Structures such as applicator pads for cleaning and other purposes, propellant compositions for forming the same and process. 3,912,667, Cl. 260-2.50E.
Spracklen, Stanford B.; and Capistiano, Hideo Watanabe, to International Biophysics Corporatio.. Sensor. 3,912,614, Cl. 204-195.00B.
Sprague, Robert H.: *See—*
Keller, Juergen H. H.; and Sprague, Robert H., 3,912,507.
Sprokel, Gerard J., to International Business Machines Corporation. Liquid crystal display assembly having polyimide layers. 3,912,366, Cl. 350-160.0LC.
Spurlock, Eugene M., to United States of America, Navy. Quick connect/disconnect dumiload sonar transducer test method. 3,913,062, Cl. 340-5.00C.
Square D Company: *See—*
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Stahl, Roland Edgar, to Du Pont de Nemours, E. I., and Company. Ethylene copolymer dispersions as water repellent coatings. 3,912,674, Cl. 260-23.0AR.
Stalder, Herbert, to Rieter Machine Works Ltd. Open-end spinning machine. 3,911,660, Cl. 57-58.890.
Standbridge, Wilbur R., to Ann Arbor Baler Company. Baling machine. 3,911,810, Cl. 100-290.000.
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Stannol-Lotmittelfabrik Wilhelm Paff: *See—*
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Stark, Bernard Peter: *See—*
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Steele, Howard R.: *See—*
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Steen, Donald B., to United States of America, Navy. Flux-switched inductor alternator. 3,912,958, Cl. 310-168.000.

Stefanek, Karel, to C.A.V. Limited. Control valves. 3,911,939, Cl. 137-58.000.

Stefek, Frantisek: *See—*
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Steffen, Ronald W., to Dickey-john Corporation. Controlled population monitor. 3,912,121, Cl. 221-13.000.

Steigerwald, Robert L.; and Park, John N., to General Electric Company. Power circuits for obtaining a high power factor electronically. 3,913,002, Cl. 321-2.000.

Stein, Robert, to Hardware Designers, Inc. Progressive drawer slide. 3,912,341, Cl. 308-3.800.

Steinhauser, Armin H.; and Baratto, Eugene L., to Minnesota Mining and Manufacturing Company. Dispenser for a roll of pressure-sensitive adhesive coated abrasive discs. 3,912,142, Cl. 225-52.000.

Steinmetz, John C. Method for sharpening drills and other cutting tools. 3,911,629, Cl. 51-288.000.

Steinmetz, John C. Chuck apparatus. 3,912,287, Cl. 279-35.000.

Stendig, Joseph L.: *See—*
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Stephan, Edward A.: *See—*
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Stephen, John F., to Ciba-Geigy Corporation. Acylated derivatives of 2,6-dihydroxy-9-azabicyclo [3.3.1]nonane. 3,912,742, Cl. 260-293.540.

Stephens, Bobby G., to Manning, Wellington M., Jr. Solvent extraction of metals with a cyclic alkylene carbonate. 3,912,801, Cl. 423-8.000.

Stephens, Frank Douglas, to Harris-Intertype Corporation. Folding apparatus. 3,912,252, Cl. 270-79.000.

Sterky, Anna Kristina: *See—*
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Stevens, Peter A. Sequential injection syringe. 3,911,916, Cl. 128-218.00R.

Stevens, Silvester William, to Precision Valve Corporation. Dispenser valve assembly for a pressurized aerosol dispenser. 3,912,132, Cl. 222-402.100.

Stevenson, Robert L. Projecting ramp and mating impeller. 3,912,271, Cl. 273-95.00F.

Stevenson, Robert L. Rotary engine. 3,912,429, Cl. 418-246.000.

Stieler, Dieter: *See—*
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Stoeckelmann, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Apparatus for continuous treatment and processing of solid and/or liquid materials. 3,912,233, Cl. 259-3.000.

Stoesz, Leander J.: *See—*
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Stoffels, Jacobus: *See—*
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Stokes, John R.; Morphew, James R.; Benes, James R.; Broline, Eric N.; and Harlan, Robert E., to Columbia Scientific Industries Corporation. Multi-media projector stand. 3,912,385, Cl. 353-94.000.

Stoler, Arie, to Israel Aircraft Industries Ltd. Anti-intrusion, self regulating switch with discriminating, sensing actuator including silicon putty. 3,912,893, Cl. 200-61.930.

Stolz, Albert, to Daimler-Benz Aktiengesellschaft. Ventilating system for passenger space of a vehicle, especially of a motor vehicle. 3,911,801, Cl. 98-2.120.

Stone, Rodney L.: *See—*
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Stookey, Stanley D.: *See—*
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Stork, Harald: *See—*
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Stovall, Leonard A. Direct current motor control. 3,912,994, Cl. 318-341.000.

Stowell, Sheldon J., to Tranter Manufacturing, Inc. Method of making a plate-type heat exchange unit. 3,911,843, Cl. 113-118.00D.

Strahle, Heinz: *See—*
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Strang, Charles D., to Outboard Marine Corporation. Low profile outboard with in-line engine. 3,911,853, Cl. 115-18.00R.

Strella, Stephen; Imperial, George R.; and Moriconi, Joseph H., to Xerox Corporation. PFA teflon sleeved chow pressure roll. 3,912,901, Cl. 219-216.000.

Strike, Donald P.: *See—*
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Struttmann, Hilarius S., to Borg-Warner Corporation. Shaft locking device. 3,912,412, Cl. 403-368.000.

Studiengesellschaft Kohle mbH: *See—*
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Stupeck, Donald G.: *See—*
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Sturmhofel, Ulrich: *See—*
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Sturwold, Robert J.; and Barrett, Fred O., to Emery Industries, Inc. Ester lubricants suitable for use in aqueous systems. 3,912,642, Cl. 252-49.500.

Stutz, William H. Film transport. 3,912,383, Cl. 352-129.000.

Suchy, Milos: *See—*
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Sudakov, Nikolai Vladimirovich: *See—*
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Suddeutsche Zucker-Aktiengesellschaft: *See—*
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Sudyk, John R., to Johnson Rubber Company, The. Truck bed liner and dock bumper combination. 3,912,325, Cl. 296-39.00R.

Sugahara, Eisuke; Yagi, Yusaku; and Owada, Akihito, to Nippon Piston Ring Co., Ltd. Mechanism for controlled air delivery to an air operated rotary body. 3,911,952, Cl. 137-580.000.

Sugai, Hidesuke: *See—*
Mikami, Ichiro; Sugai, Hidesuke; Tsujikura, Yosuke; and Ebisaka, Toshinobu, 3,912,979.

Sugaya, Hiroshi; Ishihara, Takeshi; and Sawai, Kisuke, to Matsushita Electric Industrial Co., Ltd. Method of making a magnetic head. 3,912,483, Cl. 65-43.000.

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Suggitt, Robert M.: *See—*
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Sugimoto, Yoshihiko: *See—*
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Sugiura, Susumu: *See—*
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Sumitomo Bakelite Company Limited: *See—*
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Sumitomo Chemical Company, Limited: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Sumitomo Shipbuilding and Machinery Co., Ltd.: *See—*
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Sumiyoshi, Tadashi: *See—*
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Sun Oil Company of Pennsylvania: *See—*
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Mills, Ivor W.; and Melchiore, John J., 3,912,617.
Smith, Howard C., 3,912,022.

Sunbeam Corporation: *See—*
Ponczek, George Mark; and Seitz, Charles F., 3,911,571.

Survival Technology, Inc.: *See—*
Reinhold, Herbert E., Jr., 3,911,906.

Susinn, Thommiss C. Breast pump. 3,911,920, Cl. 128-281.000.

Sutherland, Spurgeon: *See—*
Dell, Charles C.; Harms, A. D., Jr.; Knowles, Albert B.; Meredith, Fred D.; and Sutherland, Spurgeon, 3,912,198.

Suzuki, Kensuke; Ishizuka, Takeshi; and Sasaki, Takeshi, to Hitachi, Ltd. Glass encapsulated semiconductor device containing cylindrical stack of semiconductor pellets. 3,913,127, Cl. 357-73.000.

Suzuki, Shigeto, to Chevron Research Company. Production of phenol by decarboxylative hydrolysis of a chlorobenzoate salt. 3,912,784, Cl. 260-621.00R.

Suzuki, Shigeto, to Chevron Research Company. Oxo-related reaction making triethanolmethane and 3-methylpentanediol-1,5 from hexenediols. 3,912,785, Cl. 260-635.00R.

Svensson, Jan-Eric, to Siemens Aktiengesellschaft. Disposable absorbent pad. 3,911,921, Cl. 128-290.00R.

Svitenko, Igor Alexandrovich: *See—*
Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Prikhodko, Valery Alexandrovich; Alferov, Jury Fedorovich; Nosanov, Valentin Alexandrovich; Rabinovich, Volf Iudovich; and Svitenko, Igor Alexandrovich, 3,912,847.

Swanson, Harold V.; and Bald, Robert E., to Interpace Corporation. Corrosion protective collar for underground pipe joints with metal parts. 3,912,285, Cl. 277-207.000.

Swartz, William M. Article of manufacture. 3,912,842, Cl. 428-172.000.

Swihart, Donald E.: *See—*
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Tabler, Donald C.: *See—*
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Tada, Masahiro, to Sony Corporation. Bistable multivibrator circuit. 3,912,950, Cl. 307-289.000.

Tada, Shoji: *See—*
Yamada, Naoya; Nagai, Nobuo; and Tada, Shoji, 3,912,965.

Taguchi, Tatsuya; Sugiura, Yoji; Aizawa, Hiroshi; Uchidoi, Masanori; and Iwashita, Tomonori, to Canon Kabushiki Kaisha. Electrical driving device for camera. 3,913,114, Cl. 354-204.000.

Takagi, Isamu; Kawanishi, Seishi; and Nishizawa, Yoshihiko, to Sumitomo Chemical Company, Limited. Anti-fouling ship bottom paint. 3,912,519, Cl. 106-15.0AF.

Takahama, Sho, to Fuji Photo Film Co., Ltd. Shutter and viewfinder mirror inter-linkage means for a small single-lens reflex camera. 3,913,112, Cl. 354-156.000.

Takahashi, Isao; Fujii, Motoharu; Kawakubo, Kazuo; Ariga, Masao; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Developing device for use in electrophotographic copying machines. 3,912,388, Cl. 355-3.0DD.

Takahashi, Masahiko; and Hiruma, Eikyu, to Nippon Hoso Kyokai. Method for producing a porous target for an electron tube. 3,912,829, Cl. 427-78.000.

Takahashi, Tadao: *See—*
Yamagishi, Hidehisa; Kamata, Takashi; Ujiki, Yoshio; Yokoi, Fumitoshi; and Takahashi, Tadao, 3,912,846.

Takahashi, Tetsuo, to Takigen Manufacturing Co., Ltd. Switch lock assembly. 3,912,888, Cl. 200-44.000.

Takasuga, Yutaka: *See—*
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Takechi, Hiroshi: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; Fukuda, Tsunehiko; and Hatanaka, Chitoshi, 3,912,705.

Takeuchi, Hisaharu: *See—*
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Takigen Manufacturing Co., Ltd.: *See—*
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Takusagawa, Takashi; and Fujikawa, Akira, to Bridgestone Tire Company Limited. Pneumatic safety tire for motorcycles. 3,911,987, Cl. 152-354.000.

Talley, Douglas G., to Hughes Aircraft Company. Gunner accuracy control panel. 3,911,599, Cl. 35-25.000.

Talsma, Tjitte, to U.S. Philips Corporation. Deflection coil system for colour television. 3,913,042, Cl. 335-210.000.

Tamny, Simon Z.: *See—*
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Tamura, Kaoru: *See—*
Matsumoto, Takaaki; Nakamura, Takeshi; and Tamura, Kaoru, 3,912,932.

Tanaka, Akira, to American Safety Equipment Corporation. Abdominal restraint and belt storage means for child safety seats for vehicles. 3,912,328, Cl. 297-389.000.

Tanaka, Yutaka; and Nonaka, Masakatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Steering apparatus for vehicles. 3,911,759, Cl. 74-492.000.

Tanczyn, Harry: *See—*
Schumacher, William J.; and Tanczyn, Harry, 3,912,503.

Taniguchi, Hiroshi: *See—*
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Taniuchi, Osami: *See—*
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Tao, William K. Y. Air mixing device. 3,911,804, Cl. 98-38.00A.

Tarcza, Walter H.: *See—*
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Tarex-Manurhin S.A. Fabrique de Machines: *See—*
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Tarnow, Horst; and Hermann, Gunther, to Bayer Aktiengesellschaft. 3-Amino-2,4,6-trichloro-benzaldehyde-sulfonylhydrazones. 3,912,779, Cl. 260-556.00H.

Tass, Richard L. Tail gate. 3,912,326, Cl. 296-51.000.

Tate, Jack F.: *See—*
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Tatsudan, Masateru: *See—*
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Taub Family Trust: *See—*
Taub, Ronald H., 3,912,158.

Taub, Ronald H., to Taub Family Trust. Display tray with depending skirt. 3,912,158, Cl. 229-41.00B.

Taylor, Brian W.: *See—*
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Taylor, John Anthony: *See—*
Ashton, Stanley; Jones, Gwilym Thomas; Sharma, Vijay Ratna; and Taylor, John Anthony, 3,912,749.

Taylor, Paul Franklin, to TICOA Company, Incorporated, The. Process for class IV-B metals ore reduction. 3,912,498, Cl. 75-1.000.

Taylor, Robert C.: *See—*
Doan, Robert B.; Taylor, Robert C.; and Reynolds, Max H., 3,912,528.

Technical Resources, Inc.: *See—*
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TED Bildplatten Aktiengesellschaft, AEG-Telefunken-Teldec: *See—*
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Tee-Pak, Inc.: *See—*
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Tel-Tone Corporation: *See—*
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Teledyne, Inc.: *See—*
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Teledyne McCormick Sleph: *See—*
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Teller, Daniel M.; and Sellstedt, John H., to American Home Products Corporation. Bicyclic acyl penicillins. 3,912,718, Cl. 260-239.100.

Tenneco Inc.: *See—*
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McCormick, James, 3,912,306.

Tennessee Valley Authority: *See—*
McCullough, John F.; and Sheridan, Richard C., 3,912,802.

Tepas, Joseph J., Jr., to Olin Corporation. Dissolving and dispensing water soluble material containing available chlorine to a swimming pool. 3,912,627, Cl. 210-60.000.

Terzian, Rouben T., to Marvin Glass & Associates. Animated doll. 3,911,614, Cl. 46-120.000.

Terzian, Rouben T.: *See—*
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Tetra Pak International: *See—*
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Tetra Pak International AB: *See—*
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Teutsch, Marvin W., to International Memory Systems. Disk drive assembly. 3,912,278, Cl. 274-1.00R.

Texaco Development Corporation: *See—*
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Texaco Inc.: *See—*
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Texas Instruments Incorporated: *See—*
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Bean, Kenneth E.; and Akridge, Albert Neal, 3,911,559.
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Th. Goldschmidt AG: *See—*
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Th. Kieserling & Albrecht: *See—*
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Thate, Helmut; and Wamser, Manfred, to Dr. -Ing. Ludwig Pietzsch. Suspension system for vehicle capable of cross country travel. 3,912,303, Cl. 280-124.00F.

Theoclitus, Gregory, to Air Preheater Company, Inc., The. Heat accumulator system. 3,912,163, Cl. 237-13.000.

Therm-O-Disc, Incorporated: *See—*
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Thomas, Edward Lee, to General Electric Company. Pulsed microwave oscillator. 3,913,034, Cl. 331-98.000.

Thomas, Janine M.: *See—*
Huguet, Gerard J.; Fauran, Claude P.; Douzon, Colette A.; Raynaud, Guy M.; and Thomas, Janine M., 3,912,747.

Thomas, Jean P.: *See—*
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Thomas, Klaus: *See—*
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Thomas, Lucius Ponder, to RCA Corporation. Composite printed circuit board. 3,912,849, Cl. 174-16.00R.

Thomison, Everett C. Egg holder. 3,911,806, Cl. 99-411.000.

Thompson, Buster Ray. Coke oven pushing and charging machine and method. 3,912,091, Cl. 214-21.000.

Thompson, Edward J.: *See—*
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Thompson, John T.; and Gillemot, George W. Encapsulated conductor junction. 3,912,854, Cl. 174-88.00C.

Thompson, John T.; and Gillemot, George W. Encapsulating splice assembly. 3,912,855, Cl. 174-93.000.

Thompson, Paige W., to General Electric Company. Thermal actuator. 3,911,682, Cl. 60-531.000.

Thomson-Brandt: *See—*
Lacotte, Jean Pierre; Le Carvennec, Francois; Le Merer, Jean Pierre; Malissin, Roland; and Peltier, Jean Paul, 3,912,922.
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Thorn Electrical Industries Limited: *See—*
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Thornburgh, William F., to General Motors Corporation. Quick heat manifold assembly. 3,911,882, Cl. 123-122.0AB.

Thummler, Ursus; and Rothkamp, Josef, to Hoechst Aktiengesellschaft. Apparatus for separating phosphorus furnace slag and ferrophosphorus from one another. 3,912,245, Cl. 266-37.000.

Thune-Eureka A/S: *See—*
Eikenes, Erlend, 3,911,809.

TICOA Company, Incorporated, The: *See—*
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Tillery, Joe B., Jr. Ear trimming forceps. 3,911,925, Cl. 128-321.000.

TM Systems,: *See—*
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Tochilin, Jury Viktorovich: *See—*
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Todd, Andrew Stephen: *See—*
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Toews, Leonard E., to Kennametal Inc. Wear resistant grouser bar. 3,912,338, Cl. 305-54.000.

Tokutomi, Seijiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having automatic flash and shutter controls. 3,913,111, Cl. 354-127.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tomatsuri, Masakazu, to Nippon Kogaku K.K. Camera case. 3,912,137, Cl. 224-5.00V.

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Tomioka, Tatsuyuki; and Yukami, Noboru, to Matsushita Electric Industrial Co., Ltd. Method of making semiconductor piezoresistive strain transducer. 3,912,563, Cl. 156-13.000.

Tomita, Masahiro: *See—*
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Tomshany, Paul E.: *See—*
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Topf, Sam B., to Jordan Industries, Inc. Picture hook. 3,912,211, Cl. 248-217.000.

Topps Chewing Gum, Incorporated: *See—*
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Totman, Mirrel L., to Brown, Edward L., a part interest. Flanged joint sealing nut. 3,912,307, Cl. 285-382.000.

Touval, Irving, to M & T Chemicals Inc. Flame retardant compositions. 3,912,792, Cl. 260-863.000.

Townsend Company a division of Textron: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Seikan Kabushiki Kaisha: *See—*
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Toyoda Koki Kabushiki Kaisha: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tranter, David Thomas, to Lucas Electrical Company Limited, The. Method of manufacturing an extruded metal component. 3,911,715, Cl. 72-256.000.

Tranter Manufacturing, Inc.: *See—*
Stowell, Sheldon J., 3,911,843.

Traupe, Hans-Martin. Hollow body outlet for under-floor and underplaster installations. 3,911,635, Cl. 52-221.000.

Traupe, Hans-Martin. Outlet for sub-floor and concealed installations. 3,912,106, Cl. 220-3.400.

Tregear, Geoffrey W.: *See—*
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Trelease, Robert B.: *See—*
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Trevathan, Richard B., to A.A. Manufacturing. Hydraulic and mechanical no-cut earth working machine. 3,911,602, Cl. 37-86.000.

Triebskorn, Bruno: *See—*
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Trimble, Lyne S.; and Ito, Florence A., to Trimble, Lyne S., a part interest. Method of fabricating magnetochemical particles. 3,911,552, Cl. 29-458.000.

Trombone, Thomas Joseph: *See—*
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Trossman, Martin M.; and Smith, Parker. Sports game board and variable probability controllers. 3,912,270, Cl. 273-87.200.

Trower, Donald. Automotive trim strip fastener. 3,911,532, Cl. 24-73.0BC.

Troyer, Harley D., to Bangor Punta Operations, Inc. Swing-out table for recreational vehicles. 3,912,324, Cl. 296-23.00R.

Truckweld Equipment Co.: *See—*
Earnheart, Merlin E., 3,912,225.

Truman, Delbert A., to Reynolds Metals Company. Utilization of silicon fines in casting. 3,911,994, Cl. 164-72.000.

Trump, John G.; and Milde, Helmut I., to High Voltage Engineering Corporation. Moving electrode electrostatic particle precipitator. 3,912,467, Cl. 55-149.000.

Trusov, Gennady Evgenievich: *See—*
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Tschirky, John E.; and Crase, Gary Monroe, to Smith International, Inc. Wear sleeves for sealed bearings. 3,912,425, Cl. 418-48.000.

Tschirky, John E., to Smith International, Inc. Segmented stator for progressive cavity transducer. 3,912,426, Cl. 418-48.000.

Tschumperlin, Karl, to MADAG Maschinen-und Apparatebau Dietikon AG. Flat knitting machine with yarn change mechanism. 3,911,700, Cl. 66-127.000.
Tsigdinos, George A.; Hallada, Calvin J.; and McConnell, Robert W., to AMAX Inc. Method for making high surface area molybdenum metal. 3,912,660, Cl. 252-465.000.
Tsubouchi, Kaoru: *See—*
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Tsubouchi, Norio: *See—*
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Tsuchiya, Takao; Fukatsu, Kazuyoshi; and Hirokawa, Toshio, to Toyoda Koki Kabushiki Kaisha. Air bubble separating device. 3,912,468, Cl. 55-159.000.
Tsujikura, Yosuke: *See—*
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Tsukuda, Yasuo: *See—*
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Tsurushima, Katsuaki, to Sony Corporation. Protective circuit for field effect transistor amplifier. 3,912,981, Cl. 317-33.00R.
Tsuyuki, Tadaharu, to Sony Corporation. Semiconductor integrated circuit and method for manufacturing the same. 3,912,555, Cl. 148-175.000.
Tuccio, Sam A.; and Peterson, Otis G., to Eastman Kodak Company. CW Organic dye laser. 3,913,033, Cl. 331-94.50L.
Tucek, Frank J., to J. I. Case Company. Tree harvesting apparatus. 3,911,981, Cl. 144-34.00R.
Tucker, Harold: *See—*
Morris, Roger E.; and Tucker, Harold, 3,912,672.
Tucker, Harold A., to B. F. Goodrich Company, The. Latex compositions containing polymers having reactive azolide cure sites. 3,912,682, Cl. 260-29.70H.
Tucker, Joseph M., Jr.: *See—*
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Turman, William C. Oil filter and adapter. 3,912,631, Cl. 210-136.000.
Turner, Leland D.; and Zimmerman, William H., to Caterpillar Tractor Company. Vehicle transport loading and servicing means. 3,912,097, Cl. 214-152.000.
Turner, Ralph D. Blood collection, storage and administering bag. 3,911,918, Cl. 128-272.000.
Turner, William E.; and Gray, Gary L., to Container Corporation of America. Folding tub with automatic bottom. 3,912,331, Cl. 229-41.00B.
Turowski, Johannes, deceased: *See—*
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Uetake, Toshifumi; Matsubara, Masaki; and Hayamizu, Yoshisada, to Olympus Optical Co., Ltd. Microscope objectives of gaussian type having inclined optical axis. 3,912,359, Cl. 350-36.000.
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Ulert, Izaak A. Belt relaxer. 3,912,035, Cl. 180-82.00C.
Uliakko, Richard J., to Tel-Tone Corporation. Multifrequency-to-digital converter. 3,912,869, Cl. 179-84.0VF.
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Ushkow, Meyer; and Ushkow, David Elliott. Spoon constructions. 3,911,578, Cl. 30-326.000.

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Utsumi, Kazuaki; Tsubouchi, Norio; and Ohno, Tomeji, to Nippon Electric Company, Limited. Barium titanate base ceramic composition having a high dielectric constant. 3,912,527, Cl. 106-73.320.

Vaca, Humberto. Cake frosting device. 3,912,249, Cl. 269-54.500.

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Van Anrooy, Peter, to Quasar Electronics Corporation. Electronic television tuning system. 3,913,020, Cl. 325-453.000.

van Berkum, Petrus A., to Zenith Radio Corporation. Electronic timepiece having complementary electro-optical and electro-mechanical displays. 3,911,665, Cl. 58-50.00R.

Vance, James C., Sr., to Gates Rubber Company, The. Flat belt. 3,911,755, Cl. 74-231.00R.

Van Dam, Hendrik Tjapko: *See—*
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Van den Bosch, Francois J. G. High resolution color TV microscope apparatus. 3,913,128, Cl. 358-42.000.

Vandenburg, William. Tire changer. 3,911,989, Cl. 157-1.240.

van den Wittenboer, Cornelus Wilhelmus Theresia: *See—*
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Vander Laan, John S., III: *See—*
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Van Der Valk, Nicolaas Jan Leendert, to U.S. Philips Corporation. Circuit arrangement for supplying pulses having a defined pulse edge duration in a television image signal. 3,912,864, Cl. 178-69.5TV.

Vandling, John M., to Exxon Research and Engineering Company. Method and apparatus for time compression of facsimile transmissions. 3,912,861, Cl. 178-7.100.

van Herten, Jozef Marie, to Oce-van der Grinten N.V. Electrophotographic apparatus. 3,912,390, Cl. 355-14.000.

Vann, Roy R. High temperature perforating method. 3,912,013, Cl. 166-297.000.

Van Poucke, Raphael Karel; and Van Vugt, Jaak Pieter, to Agfa-Gevaert, a naamloze vennootschap. Method of incorporating photographic ingredients into hydrophilic colloids. 3,912,517, Cl. 96-100.000.

Van Poucke, Raphael Karel: *See—*
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Van Schoyck, Quentin H., to Cylpik, Incorporated. Method and apparatus for removing grease from within an exhaust system. 3,911,895, Cl. 126-299.00A.

van Soestbergen, Hans; and van Toor, Pieter, to Shell Oil Company. Device for loading tank cars. 3,911,975, Cl. 141-95.000.

Van Staagen, Eleanor, to Gordon Clothes, Inc. Active sports garments. 3,911,498, Cl. 2-74.000.

Van Stappen, Albert L., to Du Pont de Nemours, E. I., and Company. Fine detail radiographic elements and exposure method. 3,912,933, Cl. 250-475.000.

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Vargo, John W., to Filter Dynamics International, Inc. Carton for automobile air filter. 3,912,074, Cl. 206-45.140.

Varsanyi, Denis; and Roth, Willy, to Ciba-Geigy Corporation. 2-Guanidino-4,6-bis-amino-s-triazines. 3,912,518, Cl. 106-3.000.

Vasicek, Zdenek; Kral, Jan; Stefek, Frantisek; Halfar, Josef; and Rosa, Drahomir, to Moravskoslezska Armaturka. Ball valves. 3,912,220, Cl. 251-159.000.

VEB Wirkmaschinenbau Karl-Marx-Stadt: *See—*
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Veech, Robert D. Litter collector. 3,912,316, Cl. 294-19.00R.

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Veltman, Preston Leonard: *See—*
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Vereschagin, Leonid Fedorovich; Semerchian, Aik Akopovich; Modenov, Vitaly Pavlovich; Bocharova, Tamara Timofeevna; and Dmitriev, Mikhail Eremeevich. Process for producing diamond-metallic materials. 3,912,500, Cl. 75-201.000.

Vernaleken, Hugo: *See—*
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Veszi, Agnes, to La Telemecanique Electrique. Measuring device for use with an electrical transducer having parabolic resistance response. 3,913,096, Cl. 340-347.0NT.

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Vidal, Roger; and Gourmandy, Raymond, to Rhone-Poulenc-Textile S.A. Apparatus for texturizing a plurality of yarns simultaneously. 3,911,538, Cl. 28-1.600.

Vignon, Louis, to Heberlien Hispano SA. Device for surveying thread breakage, especially for automatic connecting devices in spinning machines. 3,911,656, Cl. 57-34.00R.

Viktorova, Julia Nikolaevna: *See—*
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Vince, John, to Honeywell Inc. DC power supply. 3,912,940, Cl. 307-64.000.

Vincent, Philip Conrad. Internal combustion engines. 3,911,874, Cl. 123-33.0VC.

Vinnemann, Antonius; Marz, Joachim; and Lohse, Dieter, to Franz Morat GmbH. Method and apparatus for preparing information carriers. 3,912,862, Cl. 178-15.000.

Vinz, Peter, to European Atomic Energy Community (Euratom). Process for the production of porous tubes having small pores. 3,911,547, Cl. 29-157.30R.

Virginio Rimoldi and C. S.p.A.: *See—*
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Vitali, Romano: *See—*
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Vitaliev, Georgy Viktorovich; Gvinepadze, Alexei Davidovich; Koltsova, Anastasia Adrianovna; and Smirnov, Rem Vasilievich. Associative memory. 3,913,075, Cl. 340-173.0AM.

VMGI: *See—*
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Vogel, Christian: *See—*
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Volkswagenwerk Aktiengesellschaft: *See—*
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von Bohr, Olaf, to Kartell S.p.A. Composable support structure for tables and the like. 3,912,210, Cl. 248-188.100.

Von Bredow, Brigitta; and Brechbuhler, Hans U., to Ciba-Geigy Corporation. Dicarboximide derivatives. 3,912,735, Cl. 260-250.0AC.

von den Hoff, Anton: *See—*
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von der Crone, Jost: *See—*
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Von Heitlinger, Eugene, to Schwinn Bicycle Company. Wheel rim strip assembly. 3,912,333, Cl. 301-98.000.

Von Starck, Axel, to AEG Elotherm G.m.b.H. Linear moving field inductor for electromagnetic pumps, conveyor troughs or agitator reels for liquid metals. 3,913,045, Cl. 336-60.000.

Voorhes, William G., to Wanskuck Company. Extrusion apparatus. 3,911,705, Cl. 72-45.000.

Vore, Alan Lee: *See—*
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Vrijssen, Gerardus Arnoldus Herman Maria; Stoffels, Jacobus; and Coppens, Johannes Hendrikus, to U.S. Philips Corporation. Electric discharge tube and method of manufacturing same. 3,912,851, Cl. 174-50.540.

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Vydrin, Vladimir Nikolaevich; Ageev, Leonid Matveevich; Sudakov, Nikolai Vladimirovich; Sosjurko, Vladimir Georgievich; and Trusov, Gennady Evgenievich. Method of rolling metal sheet articles. 3,911,713, Cl. 72-205.000.

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Wadano, Katsumi: *See—*
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Wagensonner, Eduard, to Agfa-Gevaert Aktiengesellschaft. Equipment for furnishing a light dependent signal substantially independent of shutter position to a motion picture camera having a rotary shutter. 3,912,384, Cl. 352-141.000.

Wagner, Howard Grady: *See—*
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Wagner, Kuno: *See—*
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Waid, George M.; and Ault, Robert T., to A. Finkl & Sons Company. Press forging die. 3,912,553, Cl. 148-38.000.

Wainer, Eugene, to Horizons Incorporated. Recovery of flexible and rigid materials from scrap polyvinylchloride, its copolymers and cogeners. 3,912,664, Cl. 260-2.300.

Wakefield, Gene Felix, to Texas Instruments Incorporated. Low temperature metal carbonitride coatings. 3,912,461, Cl. 29-195.000.

Wakihira, Koichiro: *See—*
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Walbro Corporation: *See—*
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Waldman, Abraham H.; and Bernstein, Sam. Contour seaming system and method. 3,911,839, Cl. 112-121.240.

Waleck, Edward: *See—*
Myers, John H.; and Waleck, Edward, 3,911,644.

Walford, Richard L., to J. P. Stevens & Co., Inc. Thread feeding device for inserted weft knitting machines. 3,911,698, Cl. 66-84.00A.

Walker, Duncan N.; and Kazlauskas, Matthew A., to General Electric Company. Non-contacting self-calibrating vibration sensor. 3,911,731, Cl. 73-71.400.

Walker, Hall, Sears, Inc.: *See—*
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Walker, Roger B.: *See—*
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Walter, Edward M. Window structure. 3,911,623, Cl. 49-390.000.

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Ward, David M., to Potter Electric Signal Co. Pneumatic retard having stroke-accelerating valve. 3,912,247, Cl. 267-114.000.

Waring, Donald A., to Ethyl Development Corporation. Blow molding apparatus. 3,912,435, Cl. 425-326.00B.

Warner-Lambert Company: *See—*
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Gardi, Rinaldo; Vitali, Romano; and Falconi, Giovanni, 3,912,768.
Kaminsky, Daniel, 3,912,760.
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Watanabe, Masanori; Konuma, Takaaki; and Asano, Hirokazu, to Kabushiki Kaisha KIP. Method and apparatus for charging by corona discharge. 3,912,989, Cl. 317-262.00A.

Watanabe, Nobuya: *See—*
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Watanabe, Norio: *See—*
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Watertown Table Slide Corporation: *See—*
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Wave Energy Systems, Inc.: *See—*
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Weaver, Jeffrey L., to Lawrence Peska Associates, Inc., a part interest. Anti-theft fuel inlet cover. 3,912,322, Cl. 296-1.00C.

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Wedemeyer, Karlfried; Koppelmann, Eliahu; and Evertz, Werner, to Bayer Aktiengesellschaft. Process and catalyst for preparing of 3-halogen-and 3,5-dihalogen-phenols. 3,912,783, Cl. 260-620.000.

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Weenink, Leon Pieter, to U.S. Philips Corporation. Radio receiver or television receiver with pre-selection tuning. 3,913,041, Cl. 334-7.000.

Weglin, Walter, to Jerobee Industries, Inc. Circuit board, method of making the circuit board and improved die for making said board. 3,911,716, Cl. 72-324.000.

Wehner, Donald R.; Prickett, Michael J.; and Gylling, Raymond B., to United States of America, Navy. Automatic, digitally controlled radar target matched filter. 3,913,099, Cl. 343-5.0SA.

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Werther, Karl G. Boring bar. 3,912,413, Cl. 408-143.000.

West, Allen D. Snow tire. 3,911,984, Cl. 152-208.000.

West, James I., Jr. Incinerating commode. 3,911,506, Cl. 4-131.000.

Westdale, Virgil W., to Addressograph Multigraph Corporation. Liquid developer for latent electrostatic images. 3,912,645, Cl. 252-62.100.

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Westerner Products, Inc.: *See—*
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Westervelt, Peter J.; Larson, Richard S.; and Muir, Thomas G., to United States of America, Navy. Thermooptic sonar system. 3,913,060, Cl. 340-3.00R.

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Wilkins, Wayne Eldo. Quick-clean vent filter. 3,912,473, Cl. 55-501.000.

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Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, to C.A.V. Limited. Fuel systems for engines. 3,911,883, Cl. 123-139.00E.

Williams, Thomas Alan; and Cussons, Frank Michael, to Albright & Wilson Limited. Purification of phosphoric acid. 3,912,803, Cl. 423-321.000.

Williamson, Clyde E.; Acker, Roy M.; Greenbaum, Gilbert A.; and Phillips, William J., to TRW Inc. Collapsible self-erecting tubular frame structure and deployable electromagnetic reflector embodying same. 3,913,105, Cl. 343-840.000.

Williamson, David Howard, to Bell Telephone Laboratories, Incorporated. Equipment handle with positive locking attachment to finned surfaces. 3,912,321, Cl. 294-27.00H.

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Wiltrout, Dale E., to Allen Group Inc., The. Fully automatic vehicle wash water reclaim system. 3,911,938, Cl. 134-104.000.

Wiltshire, Arthur J.; Ranallo, Henry U.; and Czumber, Frank E., to Structural Fibers, Inc. Fiber preform and method and apparatus for making same. 3,911,965, Cl. 138-178.000.

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Wolff, Hans Peter; Witte, Ernst-Christian; Stach, Kurt; Stork, Harald; and Roesch, Egon, to Boehringer Mannheim G.m.b.H. New phenoxyalkyl-carboxylic acid compounds and therapeutic compositions. 3,912,756, Cl. 260-326.13R.

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Youmans, Albert Peeplis, to Signetics Corporation. Method of chemical polishing of planar silicon structures having filled grooves therein. 3,911,562, Cl. 29-590.000.
Young, David Arthur. Conductive human electrical terminal. 3,912,973, Cl. 317-2.00B.
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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ando, Yujiro: *See*—
Saito, Takashi; and Ando, Yujiro, Re. 28,568.

Canon Kabushiki Kaisha: *See*—
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Cummings, Lowell O., to PVO International Inc. In situ process for transisomerization and conjugation of resins containing fatty acid esters. Re. 28,569, Cl. 260-18.0EP.

General Electric Company: *See*—
Lange, Kai, Re. 28,571.

Lange, Kai, to General Electric Company. Attenuated light coupling between scintillation and photomultiplier. Re. 28,571, Cl. 250-366.000.

Phillips Petroleum Company: *See*—
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Saito, Takashi; and Ando, Yujiro, to Canon Kabushiki Kaisha. Electrophotographic copying machine. Re. 28,568, Cl. 355-15.000.

Tetronics Research and Development Co. Ltd.: *See*—
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Thornhill, William J.; and Welty, Richard O., to Phillips Petroleum Company. Signal generation. Re. 28,572, Cl. 307-106.000.

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Andersson, Allan Y. T. Hand saw. 237,140, 10–14–75, Cl. D8—95.

Barnes, Richard D., to Southern Imperial, Inc. Combined hanger arm and bracket for use with perforated panels. 237,142, 10–14–75, Cl. D8—255.

Barr, Josiah, to Hughes Aircraft Co. Combined reusable equipment transporter and storage module. 237,145, 10–14–75, Cl. D9—246.

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Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Typewriter. 237,215, 10–14–75, Cl. D64—11.

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Bluem, Gary R. Pneumatic tire pressure tester. 237,152, 10–14–75, Cl. D10—86.

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Bojicic, Savo. Receptacle for the random mixing and display of enclosed inscribed pieces. 237,200, 10–14–75, Cl. D34—5.

Bonsack, Horst G. Bathtub. 237,183, 10–14–75, Cl. D23—55.

Boone, Richard B. Traffic sign for a school zone. 237,154, 10–14–75, Cl. D10—109.

Brilando, Frank P., and R. L. Schwinn, to Schwinn Bicycle Co. Bicycle reflector. 237,155, 10–14–75, Cl. D10—111.

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Clark, Floyd R. Fireplace screen. 237,137, 10–14–75, Cl. D7—208.

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Faraco, William G., Jr. Chemical vapor deposition reactor. 237,209, 10–14–75, Cl. D55—1.

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Hoffman, William A., to GTE Information Systems Inc. Holder for a light sensing pen. 237,174, 10–14–75, Cl. D19—84.
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Klotz, Jon W., E. A. Oster, and H. J. Hoehn, to Owens-Illinois Inc. Light emitting gas discharge matrix display panel. 237,193, 10–14–75, Cl. D26–5.
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CLASS 57
34HS 3,911,655
34R 3,911,656
3,911,657
3,911,658
58.89 3,911,659
3,911,660
77.4 3,911,661
149 3,911,662

CLASS 58
23BA 3,911,663
23R 3,911,664
50R 3,911,665
3,911,666
58 3,911,667
85.5 3,911,668
88C 3,911,669
3,911,670

CLASS 59
89 3,911,671

CLASS 60
39.32 3,911,672
229 3,911,673
278 3,911,674
283 3,911,675
301 3,911,676
368 3,911,677
400 3,911,678
413 3,911,679
529 3,911,680
531 3,911,682
553 3,911,681
641 3,911,683
644 3,911,684
706 3,911,685

CLASS 61
45D 3,911,686
46.5 3,911,687
72.3 3,911,688
3,911,689
3,911,690

CLASS 62
7 3,912,475
37 3,912,476
137 3,911,691
3,911,692
151 3,911,693
499 3,911,694

CLASS 65
1 3,912,477
2 3,912,478
3,912,479
30 3,912,480
3,912,481
43 3,912,482
3,912,483
70 3,912,484
136 3,912,485
3,912,486
141 3,912,487
326 3,912,488

CLASS 66
1R 3,911,695
9B 3,911,696
50B 3,911,697
84A 3,911,698
86M 3,911,699
127 3,911,700

CLASS 68
18F 3,911,701
177 3,911,702

CLASS 69
37 3,911,703

CLASS 71
28 3,912,490
34 3,912,491
76 3,912,492
79 3,912,493
87 3,912,494
90 3,912,495
91 3,912,489
92 3,912,496
104 3,912,497

CLASS 72
42 3,911,704
45 3,911,705
56 3,911,706
75 3,911,707
98 3,911,708
179 3,911,709
193 3,911,710
203 3,911,711
205 3,911,713
209 3,911,714
256 3,911,715
324 3,911,712
3,911,716
331 3,911,717
342 3,911,718
345 3,911,719
406 3,911,720
441 3,911,721
479 3,911,722

CLASS 73
1R 3,911,723
3 3,911,724
15.4 3,911,725
32A 3,911,726
49.2 3,911,727
55 3,911,728
67.5H 3,911,729
67.7 3,911,730
71.4 3,911,731
71.6 3,911,732
88A 3,911,733
91 3,911,734
102 3,911,735
139 3,911,736
141A 3,911,737
141R 3,911,738
146 3,911,739
153 3,911,740
3,911,741
194EM 3,911,742
229 3,911,743
304R 3,911,744
341 3,911,745
343R 3,911,747
343.5 3,911,746
418 3,911,748
423A 3,911,749
432R 3,911,750
464 3,911,751

CLASS 74
10A 3,911,752
40 3,911,753
102 3,911,754
231R 3,911,755
410 3,911,756
437 3,911,757
462 3,911,758
492 3,911,759
512 3,911,760
527 3,911,761
543 3,911,762
553 3,911,763
577R 3,911,764
801 3,911,765

CLASS 75
1 3,912,498
3 3,912,499
11 3,912,501
42 3,912,502
125 3,912,503
201 3,912,500

CLASS 76
101R 3,911,766

CLASS 82
37 3,911,767
86 3,911,768

CLASS 83
4 3,911,769
27 3,911,770
81 3,911,771
278 3,911,772
320 3,911,773
425.2 3,911,774
626 3,911,775

CLASS 84
1.11 3,911,776
1.16 3,911,777
267 3,911,778
392 3,911,784
411 3,911,779
423 3,911,780

CLASS 85
47 3,911,781
67 3,911,782
73 3,911,783

CLASS 87
1 3,911,785

CLASS 89
1.5R 3,911,786
34 3,911,787

CLASS 90
20 3,911,788

CLASS 91
167R 3,911,790
321 3,911,789
499 3,911,791
505 3,911,792

CLASS 92
33 3,911,793
61 3,911,794
63 3,911,795
101 3,911,796

CLASS 93
1C 3,911,797
36.6 3,911,798
53R 3,911,799
93HT 3,911,800

CLASS 96
1M 3,912,504
1R 3,912,510
1.2 3,912,505
1.5 3,912,506
3,912,507
3,912,509
3,912,511
1.6 3,912,508
49 3,912,512
56.5 3,912,513
60R 3,912,514
84R 3,912,515
85 3,912,516
.100 3,912,517

CLASS 98
2.12 3,911,801
2.14 3,911,802
38A 3,911,804
94 3,911,803

CLASS 99
353 3,911,805
411 3,911,806

CLASS 100
37 3,911,807
38 3,911,808
148 3,911,809
290 3,911,810
295 3,911,811

CLASS 101
1 3,911,812
43 3,911,813
93.16 3,911,814
148 3,911,815
3,911,816
288 3,911,817
426 3,911,818
459 3,911,819

CLASS 102
38 3,911,820
45 3,911,821
70.2R 3,911,822
86.5 3,911,823
92.7 3,911,824
100 3,911,825

CLASS 104
135 3,911,826
147R 3,911,827
148LM 3,911,828

CLASS 105
157R 3,911,829
164 3,911,830
372 3,911,832
378 3,911,831
402 3,911,833

CLASS 106
3 3,912,518
15AF 3,912,519
22 3,912,520
42 3,912,521
47R 3,912,522
48 3,912,523
52 3,912,524
54 3,912,525
55 3,912,526
73.32 3,912,527
111 3,912,528
187 3,912,529
213 3,912,530
3,912,531
308N 3,912,532

CLASS 108
57 3,911,834
87 3,911,835

CLASS 110
8R 3,911,836

CLASS 111
7 3,911,837

CLASS 112

70	3,911,838
121.24	3,911,839
153	3,911,840
184	3,911,841
265	3,911,842

CLASS 113

118D	3,911,843

CLASS 114

5R	3,911,844
39	3,911,845
66.5R	3,911,846
150	3,911,847
185	3,911,848
222	3,911,849
235A	3,911,850

CLASS 115

12R	3,911,851
17	3,911,852
18R	3,911,853

CLASS 116

63P	3,911,854
114W	3,911,855
121	3,911,856
132R	3,911,857
137A	3,911,858

CLASS 118

1	3,911,859
6	3,911,860
7	3,911,861
	3,911,862
68	3,911,863
637	3,911,864
	3,911,865

CLASS 119

26	3,911,866
52B	3,911,867
53	3,911,868
61	3,911,869

CLASS 123

8.01	3,911,870
25K	3,911,871
32EA	3,911,872
32ST	3,911,873
33VC	3,911,874
41.31	3,911,876
41.34	3,911,875
41.49	3,911,877
80R	3,911,878
90.16	3,911,879
117A	3,911,880
122AB	3,911,881
	3,911,882
139AW	3,911,884
139E	3,911,883
140R	3,911,885
148R	3,911,886
	3,911,887
	3,911,889
179H	3,911,890
191A	3,911,891

CLASS 124

11R	3,911,888

CLASS 126

9R	3,911,892
21A	3,911,893
121	3,911,894
299A	3,911,895
350A	3,911,896

CLASS 127

13	3,912,533

CLASS 128

1D	3,911,897
	3,911,898
2D	3,911,900
2E	3,911,901
2S	3,911,899
2.05D	3,911,902
2.05G	3,911,904
2.05Q	3,911,903
2.06E	3,911,906
2.06R	3,911,905
24R	3,911,907
25R	3,911,908
76B	3,911,909
82.1	3,911,910
130	3,911,911
132D	3,911,912
142.5	3,911,913
142.7	3,911,914
214R	3,911,915
218R	3,911,916
263	3,911,917
272	3,911,918
276	3,911,919
281	3,911,920
290R	3,911,921
296	3,911,922
303A	3,911,923
303.1	3,911,924
321	3,911,925
325	3,911,926
349R	3,911,927
418	3,911,928
419PG	3,911,929
421	3,911,930
425	3,911,931

CLASS 131

15B	3,911,932
47	3,911,933

CLASS 132

9	3,911,934
33	3,911,935
79R	3,911,936

CLASS 134

1	3,911,937
19	3,912,534
22C	3,912,535
104	3,911,938

CLASS 136

6R	3,912,536
26	3,912,537
86D	3,912,538
89	3,912,539
	3,912,540
90	3,912,541
111	3,912,543
134R	3,912,544

CLASS 137

58	3,911,939
79	3,911,940
116	3,911,941
117	3,911,942
341	3,911,943
355.2	3,911,944
359	3,911,946
499	3,911,945
505.14	3,911,947
505.42	3,911,948
525	3,911,949
543.17	3,911,950
550	3,911,951
580	3,911,952
595	3,911,953
615	3,911,954
624.2	3,911,955
625.46	3,911,956
625.48	3,911,957
798	3,911,958

CLASS 138

36	3,911,959
96R	3,911,960
113	3,911,961
125	3,911,962
140	3,911,963
176	3,911,964
178	3,911,965

CLASS 139

1R	3,911,966
116	3,911,967
127P	3,911,968
370	3,911,969

CLASS 140

93.4	3,911,970

CLASS 141

1	3,911,971
7	3,911,972
59	3,911,973
84	3,911,976
94	3,911,974
95	3,911,975
348	3,911,977

CLASS 144

2N	3,911,979
2R	3,911,978
3D	3,911,980
34R	3,911,981
309AC	3,911,982

CLASS 145

50A	3,911,983

CLASS 148

1.5	3,912,545
	3,912,546
6.11	3,912,547
6.15R	3,912,548
12C	3,912,549
23	3,912,550
31	3,912,552
31.5	3,912,551
38	3,912,553
105	3,912,554
175	3,912,555
	3,912,556
187	3,912,557
	3,912,558
	3,912,559

CLASS 149

35	3,912,561
41	3,912,562
47	3,912,560

CLASS 152

208	3,911,984
	3,911,985
210	3,911,986
354	3,911,987
427	3,911,988

CLASS 156

13	3,912,563
60	3,912,564
85	3,912,565
104	3,912,542
167	3,912,567
203	3,912,568
230	3,912,569
330	3,912,566
351	3,912,570
	3,912,571
381	3,912,572
471	3,912,573
502	3,912,574
515	3,912,575
580	3,912,576

CLASS 157

1.24	3,911,989

CLASS 159

4A	3,912,577
20R	3,912,578

CLASS 160

100	3,911,990
202	3,911,991
290	3,911,992

CLASS 162

4	3,912,579
30	3,912,580
164	3,912,581

CLASS 164

55	3,911,993
72	3,911,994
82	3,911,995
	3,911,996
147	3,911,997

CLASS 165

10	3,911,998
41	3,911,999
47	3,912,000
80	3,912,001
104	3,912,002
165	3,912,003
166	3,912,004
169	3,912,005

CLASS 166

175	3,912,007
212	3,912,008
216	3,912,006
240	3,912,009
270	3,912,010
271	3,912,011
285	3,912,012
297	3,912,013
315	3,912,014

CLASS 169

61	3,912,015

CLASS 171

133	3,912,016

CLASS 172

328	3,912,017
	3,912,018
691	3,912,019
699	3,912,020

CLASS 173

46	3,912,021
93.7	3,912,022
131	3,912,023
152	3,912,024

CLASS 174

16R	3,912,849
28	3,912,850
50.54	3,912,851
68.5	3,912,852
84C	3,912,853
88C	3,912,854
93	3,912,855

CLASS 175

91	3,912,025
297	3,912,026

CLASS 176

36R	3,912,582
40	3,912,583
	3,912,584

CLASS 177

	3,912,027
44	3,912,028
210	3,912,029

CLASS 178

6.5	3,912,856
6.6A	3,912,857
6.6R	3,912,858
6.8	3,912,859
	3,912,860
7.1	3,912,861
15	3,912,862
17.5	3,912,863
69.5TV	3,912,864

CLASS 179

1CN	3,912,867
1E	3,912,865
	3,912,866
1.5R	3,912,868
15AQ	3,912,871
15BA	3,912,872
15FS	3,912,870
18BC	3,912,874
18FC	3,912,873
41A	3,912,875
	3,912,876
80	3,912,877
84VF	3,912,869
170R	3,912,878
175	3,912,879
175.1A	3,912,880
175.2R	3,912,881
175.3A	3,912,885
175.3R	3,912,882
	3,912,883
	3,912,884

CLASS 180

5R	3,912,030
9.26	3,912,031
13	3,912,032
33D	3,912,039
66R	3,912,033
82C	3,912,035
82R	3,912,034
90	3,912,036
98	3,912,037
126	3,912,038

CLASS 181

42	3,912,040
110	3,912,041
118	3,912,042

CLASS 182

23	3,912,043

CLASS 184

6.16	3,912,044
27R	3,912,045
55A	3,912,046

CLASS 186

1R	3,912,047

CLASS 187

9R	3,912,048
61	3,912,049

CLASS 188

69	3,912,050
72.5	3,912,051
181A	3,912,052
236	3,912,053
282	3,912,054

CLASS 190

52	3,912,055

CLASS 192

3T	3,912,056
4C	3,912,057
18A	3,912,058
105CD	3,912,059
113B	3,912,060
133	3,912,061

CLASS 193

36	3,912,062

CLASS 194

92	3,912,063

CLASS 195

28N	3,912,587
28R	3,912,585
	3,912,586
29	3,912,588
	3,912,589
31P	3,912,591
31R	3,912,590
	3,912,592
57	3,912,593
65	3,912,594
66R	3,912,595
127	3,912,596

CLASS 197

6.7	3,912,064
19	3,912,065
46	3,912,066
84R	3,912,067
127R	3,912,068
186B	3,912,069

CLASS 198

35	3,912,070
38	3,912,071
183	3,912,072

CLASS 200

11A	3,912,886
16D	3,912,887
44	3,912,888
51.1	3,912,889
61.41	3,912,890
61.67	3,912,891
61.89	3,912,892
61.93	3,912,893
153LA	3,912,894
164A	3,912,895
337	3,912,896

CLASS 202

102	3,912,597
185	3,912,598

CLASS 203

61	3,912,599
73	3,912,600

CLASS 204

56R	3,912,601
58	3,912,602
146	3,912,603
158HA	3,912,604
159.14	3,912,605
159.15	3,912,606
	3,912,608
159.23	3,912,607
180G	3,912,610
180R	3,912,609
192	3,912,611
	3,912,612
195B	3,912,614
195R	3,912,613
243R	3,912,615
286	3,912,616

CLASS 206

1.5	3,912,073
45.14	3,912,074
158	3,912,075
320	3,912,076
387	3,912,077
455	3,912,078
463	3,912,079
498	3,912,080
531	3,912,081
	3,912,082

CLASS 208

14	3,912,617
87	3,912,618
120	3,912,619
210	3,912,620
216	3,912,621

CLASS 209

17	3,912,622
167	3,912,623

CLASS 210

23	3,912,624
30	3,912,625
50	3,912,626
60	3,912,627
75	3,912,628
114	3,912,629
130	3,912,630
136	3,912,631
137	3,912,632
168	3,912,633
222	3,912,634
242	3,912,635
264	3,912,636
321	3,912,637
455	3,912,638

CLASS 211

50	3,912,083
57	3,912,084
153	3,912,085
162	3,912,086
177	3,912,087

CLASS 212

8R	3,912,088

CLASS 214

1BC	3,912,089
17DB	3,912,090
21	3,912,091
75H	3,912,093
75R	3,912,092
83.36	3,912,094
131A	3,912,095
138R	3,912,096
152	3,912,097
450	3,912,098
453	3,912,099

CLASS 215

12	3,912,100
220	3,912,101
249	3,912,102

CLASS 219

58	3,912,897
69M	3,912,898
69V	3,912,899
91	3,912,900
216	3,912,901
228	3,912,902
375	3,912,903
413	3,912,904
464	3,912,905
486	3,912,906
535	3,912,907
553	3,912,908

CLASS 220

1.5	3,912,103
2.1A	3,912,104
	3,912,105
3.4	3,912,106
9F	3,912,107
66	3,912,109
67	3,912,110
84	3,912,111
85B	3,912,112
268	3,912,113
	3,912,114
277	3,912,115
288	3,912,116
293	3,912,117
306	3,912,118

CLASS 221

7	3,912,120
13	3,912,121
162	3,912,122
237	3,912,123
298	3,912,124

CLASS 222

165	3,912,125
189	3,912,129
307	3,912,126
309	3,912,127
396	3,912,130
402.1	3,912,131
	3,912,132
496	3,912,133
504	3,912,134
541	3,912,128
561	3,912,135

CLASS 223

37	3,912,136

CLASS 224

5V	3,912,137
10	3,912,138
29R	3,912,139
45P	3,912,140
46R	3,912,141

CLASS 225

52	3,912,142

CLASS 226

3	3,912,143
	3,912,144
44	3,912,145
95	3,912,146
151	3,912,147

CLASS 228

2.5	3,912,148
20	3,912,149
50	3,912,150
171	3,912,151
173	3,911,553
190	3,912,152
254	3,912,153

CLASS 229

5.5	3,912,154
33	3,912,155
37R	3,912,156
40	3,912,157
41B	3,912,158
	3,912,331
42	3,912,159
69	3,912,160

CLASS 235

61.11R	3,912,909
92C	3,912,910
144HC	3,912,911
150.1	3,912,912
	3,912,913
152	3,912,914
	3,912,915
	3,912,916
156	3,912,917

CLASS 236

1A	3,912,161
11	3,912,162

CLASS 237

13	3,912,163

CLASS 239

5	3,912,164
11	3,912,165
20	3,912,166
66	3,912,167
102	3,912,168
110	3,912,169
177	3,912,170
230	3,912,171
265.35	3,912,172
443	3,912,173

CLASS 240

1.4	3,912,918
6.4W	3,912,919
9.5	3,912,920
	3,912,921

CLASS 241

24	3,912,174
73	3,912,175
93	3,912,176
110	3,912,178
248	3,912,179

CLASS 242

4BE	3,912,180
7.02	3,912,181

7.07 3,912,182
7.08 3,912,183
47.01 3,912,184
47.03 3,912,185
55 3,912,186
56.1 3,912,190
57.1 3,912,193
66 3,912,187
75.2 3,912,188
75.43 3,912,189
3,912,191
107.4 3,912,177
3,912,192
188 3,912,205
199 3,912,194
201 3,912,195
204 3,912,196

CLASS 244

3.13 3,912,197
3.16 3,912,198
17.11 3,912,199
3,912,200
23D 3,912,201
52 3,912,202
122AD 3,912,203
154 3,912,204

CLASS 248

24 3,912,206
25 3,912,207
99 3,912,208
155.1 3,912,209
188.1 3,912,210
217 3,912,211
223 3,912,212
233 3,912,213
323 3,912,214
421 3,912,215
475R 3,912,216

CLASS 249

31 3,912,217
207 3,912,218

CLASS 250

204 3,912,922
211J 3,912,923
221 3,912,924
227 3,912,925
231SE 3,912,926
234 3,912,927
302 3,912,928
303 3,912,929
366 Re.28,571
398 3,912,930
458 3,912,931
468 3,912,932
475 3,912,933
504 3,912,934
506 3,912,935
512 3,912,936

CLASS 251

128 3,912,219
159 3,912,220
214 3,912,221
282 3,912,222
299 3,912,223

CLASS 252

8.05 3,912,647
33.4 3,912,639
47.5 3,912,640
3,912,641
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	3,912,391	3,911,806	3,912,426	3,912,999	3,912,348	3,911,619
	3,912,403	3,911,814	3,912,460	3,913,000	3,912,358	3,911,649
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